ATTACHMENT

6

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM HAZARDOUS WASTE COMBUSTORS (40 CFR PART 63, SUBPART EEE)

NOTIFICATION OF COMPLIANCE AND COMPREHENSIVE PERFORMANCE TEST REPORT – KILN 1

FOR

ESSROC CEMENT CORP.
LOGANSPORT, INDIANA

February 2010

PREPARED FOR:

ESSROC CEMENT CORP.
3084 WEST COUNTY ROAD 225 SOUTH
LOGANSPORT, INDIANA 46947

PROJECT NO. 080128

SCHREIBER & YONLEY ASSOCIATES
ENVIRONMENTAL ENGINEERS

16252 Westwoods Business Park Drive • Ellisville, MO 63021 • (636) 256-7200
www.perma-fix.com/sya

COMPLIANCE STATEMENT

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, to the best of my knowledge, the information is, true, accurate, and complete, and the Essroc Cement Corp., Logansport, Indiana cement plant is in compliance with the applicable standards and requirements of 40 CFR Part 63, subpart EEE as set forth in this document.

I also certify that required continuous emission monitoring systems, and compliance monitoring systems are installed, calibrated, and are to be continuously operating in compliance with the applicable requirements of Subpart EEE during affected facility operations.

I acknowledge that the operating limits established in this document are enforceable limits at which the facility can legally operate until a revised Notification of Compliance is prepared in accordance with applicable requirements.

Signature: ____

Date: ________________

Printed Name: Mike McHugh
Title: Plant Manager
Company: Essroc Cement Corp.

TABLE OF CONTENTS

TABLES

ATTACHMENTS

ABBREVIATIONS, ACRONYMS, AND TERMS

°F	Degrees Fahrenheit
12-HRA	Twelve-hour rolling average
acfm	Actual cubic feet per minute
APCD	Air pollution control device
Avogardo	Avogardo Environmental Corporation
AWFCO	Automatic waste feed cutoff
B3	B3 Systems
BLDS	Bag leak detector system
Btu	British thermal unit
CEMS	Continuous emission monitoring system
CFR	Code of Federal Regulations
CKD	Cement kiln dust
Cl_2	Chlorine/Chlorine gas
CMS	Continuous monitoring system
COMS	Continuous opacity monitoring system
CPT	Comprehensive Performance Test
CWDF	Containerized waste-derived fuel
D/F	Dioxins and furans
DOC	Documentation of Compliance
DRE	Destruction and removal efficiency
dscf	Dry standard cubic feet 20°C, 760 mm Hg (68°F, 29.92 in. Hg)
dscfm	Dry standard cubic feet per minute
dscm	Dry standard cubic meters at 20°C, 760 mm Hg (68°F, 29.92 in. Hg)
EHS	Environmental health and safety
ELS	Environmental Labs and Services, Inc.
EPA	United States Environmental Protection Agency
ESP	Electrostatic precipitator
Essroc	Essroc Cement corp.
FAP	Feedstream Analysis Plan
FTL	Field team leader
g	Gram
gr	Grains
HAP	Hazardous air pollutant
HC	Hydrocarbons
HCl	Hydrogen chloride/hydrochloric acid
Hg	Mercury
HRA	Hourly rolling average
hr	Hour
HWC	Hazardous waste combustor
HWC NESHAP Rule	National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors (40 CFR Part 63, subpart EEE)
HWDF	Hazardous waste-derived fuel
ID	Induced draft
IDEM	Indiana Department of Environmental Management

ABBREVIATIONS, ACRONYMS, AND TERMS (continued)

lb	Pound
L	Liter
LCS	Laboratory control spike
LM	Laboratory manager
LVM	Low-volatile metal
LWDF	Liquid hazardous waste-derived fuel
Maxxam	Maxxam Analytics, Inc.
Method 0023A	SW-846 Sample Preparation and Analytical Method 0023A
Method 23	40 CFR Part 60 Appendix A, Method 23
min	Minute
mL	Milliliter
MS	Matrix spike
MTEC	Maximum theoretical emission concentration
ND	Non-detectable
ng	Nanogram (10^{-9}g)
NIST	National Institute of Standards and Technology
NOC	Notification of compliance
O_2	Oxygen
OMP	Operation and Maintenance Plan
OPL	Operating parameter limit
OTCP	Operator Training and Certification Plan
PC NESHAP Rule	National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry (40 CFR Part 63, subpart LLL)
PDS	Post-digestion spike
Plant	Logansport cement plant
PLC	Programmable logic controller
PM	Particulate matter
PM	Project Manager
POHC	Principle organic hazardous constituent
ppm	Parts per million
PS	Performance specification
PTFE	Polyfluorotetraethylene
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RPD	Relative percent difference
RSD	Relative standard deviation
sec	Second
SRE	System removal efficiency
SSMP	Startup, Shutdown, and Malfunction Plan
STD	Standard deviation
Subpart EEE	National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors (40 CFR Part 63, subpart EEE)
Subpart LLL	National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry (40 CFR Part 63, subpart LLL)
SVM	Semi-volatile metal

ABBREVIATIONS, ACRONYMS, AND TERMS (continued)

SVOST	Semi-volatile organic sampling train
SYA	Schreiber, Yonley & Associates
TCB	1,2,4-Trichlorobenzene
TEQ	Toxic Equivalents
THC	Total Hydrocarbons
tph	Tons per hour
TTL	Teat Team Leader
ug	Microgram (10^{-6}g)
UTL	Upper tolerance limit
VOST	Volatile organic sampling train
W.C.	Water column
Weston	Weston Solutions, Inc.

1.0 INTRODUCTION

1.1 Scope, Purpose, and Objectives

This document has been developed in accordance with sections 63.1207(a) through (j) and 63.1210(a) of 40 CFR part 63, subpart EEE, *National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors* (hereinafter "Subpart EEE"). It is intended to serve as a Notification of Compliance (NOC) documenting the Essroc Cement Corp. (Essroc) Logansport, Indiana cement manufacturing facility's compliance with applicable Subpart EEE comprehensive performance testing requirements, emission standards, continuous monitoring system (CMS) requirements, and operating parameter limits (OPLs).

Under section 63.1207, affected facilities must develop and include the following information in their NOC:

- methods that were used to determine compliance with Subpart EEE;
- results of any performance tests, opacity or visible emissions observations, CMS performance evaluations, and/or other monitoring procedures or methods that were conducted (including analysis of samples, determination of emissions, and raw data, as appropriate);
- methods that will be used to determine continuing compliance, including a description of monitoring and reporting requirements and test methods;
- an analysis demonstrating whether the affected source is a major source or an area source;
- a description of the air pollution control equipment (or method) for each emission point, including each control device (or method) for each hazardous air pollutant and the control efficiency for each control device (or method); and,
- a statement by the owner or operator of the affected source as to whether the source has complied with the relevant standard or other requirements.

Each of these requirements is addressed in this NOC. Upon submittal (postmark) of this NOC to the appropriate United States Environmental Protection Agency (EPA) and/or Indiana Department of Environmental Management (IDEM) authority, the facility will comply with the operating requirements specified herein in lieu of the limits specified in the facility's Documentation of Compliance (DOC) required under section 63.1211(c) of Subpart EEE.

1.2 Facility Process Information

Essroc is a major manufacturer of portland cement in the United States. Essroc owns and operates a portland cement plant located in rural Cass County, Indiana, approximately 1.0 mile north of State Road 25 and approximately 2.5 miles southwest of the city of Logansport, Indiana. The facility is located in Clinton Township, which has a population of less than 500 people. The closest city, Logansport, has a population of approximately 15,000 people.

The facility began operation in 1961 at this location with one wet-process kiln system. The second unit was added in 1965, and both remain operating today.

Generally, the cement manufacturing process involves the following steps:

- quarrying and crushing of limestone and acquisition of other raw materials;
- proportioning and grinding the raw materials to form a slurry feed of a chemical composition with potential to form portland cement compounds;
- pyroprocessing the slurry in the two wet process rotary cement kilns to form portland cement clinker; and,
- grinding the clinker with gypsum and other additives to form portland cement.

After quarrying, limestone is mixed with other raw materials containing alumina, iron, and silica. These materials are secured from on-site quarry-processed natural raw materials, from outside sources, or from non-hazardous raw materials containing sufficient levels of alumina, silica, iron, or calcium.

These raw materials are first ground with water to form a slurry/paste called "kiln feed" that contains approximately 37 percent water. The kiln feed is then pumped into the upper (cold or back) end of the kiln, and, as the kiln feed moves forward toward the lower end (burning zone), the water is evaporated. The second pyroprocessing phase of the kiln converts the raw materials to their oxide forms. Finally, as the kiln feed reaches the burning zone, the oxides chemically combine into a product called "clinker." Chemically, clinker is composed primarily of tricalcium silicate, tricalcium aluminate, dicalcium aluminate, and tetra calcium aluminoferrite. Material temperatures of approximately 2,500°F are needed to form these compounds. The kilns are fired with solid fossil fuels (petroleum coke/coal), pumpable and containerized hazardous waste fuel, used oil, non-hazardous waste fuels, and No. 2 fuel oil.

Once formed, the clinker is discharged from the rotary kiln into the clinker cooler where it is cooled using a grate cooler system. Ambient air is forced up through holes in the moving grates to cool the clinker as the grates move the material toward the discharge chute. Hot air from the cooler is recycled back into the kiln to recover its latent heat content. The cooled clinker is discharged from the cooler and transferred by conveyor to storage.

From storage, clinker is mixed with gypsum, grinding aids, and other additives and ground into a fine powder called "cement". The facility produces approximately 450,000 tons of clinker per year.

Exhaust gases comprising particulates and combustion/process gases exit the rotary kiln and enter an air pollution control device (APCD). Each kiln has a separate APCD that discharges the cleaned flue gases into one common discharge stack. The stack exit is approximately 204 feet above ground level.

2.0 EXECUTIVE SUMMARY

2.1 Introduction

Under Subpart EEE, Essroc must conduct a Comprehensive Performance Test (CPT) to demonstrate compliance with the applicable emission standards of section 63.1220, establish applicable OPLs pursuant to section 63.1209, and demonstrate compliance with the performance specifications (PSs) for affected CMSs. This section provides an overview of the CPT, CMS performance evaluations, and OPL establishment activities conducted by Essroc. In addition, a summary of other information documenting compliance with applicable operating requirements is provided. Finally, affected air pollution control equipment is identified. The information summarized in this section is addressed in greater detail in later sections.

2.2 Comprehensive Performance Test Overview and Results

For Kiln 1, compliance testing was conducted under Condition I from October 6–10, 2009 and under Condition II from November 4-5, 2009 at Essroc's Logansport, Indiana portland cement manufacturing facility in order to demonstrate compliance with applicable Subpart EEE emission standards and operating requirements. The CPT was conducted in accordance with the approved CPT Plan (Attachment A) and as amended by the correspondence included in Attachment B. Section 6.0 addresses relevant deviations from the CPT Plan and/or implementation changes that occurred during the CPT.

Three separate test conditions, consisting of three test runs each, were completed to generate the data used to demonstrate compliance with the standards.

Table 2-1 presents a summary of the test run results for Subpart EEE-regulated HAPs and destruction and removal efficiency (DRE). The table also contains the regulatory citation for the standards and the established limits.

Table 2-1. Summary of CPT Runs and Associated HAP Emission Limits

Parameter	Subpart EEE Citation	Test Condition/ Runs	Units	Kiln 1 Test Run Values			Test Average	Subpart EEE Standard
DRE (TCB[1])	63.1220(c)(1)	II / 1, 2, 3	%	99.9985	99.9987	99.9987	99.9986	99.99
DRE (C_2Cl_4[2])	63.1220(c)(1)	II / 1, 2, 3	%	99.9993	99.9993	99.9994	99.9993	99.99
D/F	63.1220(a)(1)	I B/ 1, 2, 3	ng TEQ/dscm[3]	<0.0485	<0.0327	<0.0254	<0.0355	0.4
PM	63.1220(a)(7)	I A / 1, 2, 3	gr/dscf[3]	0.0036	0.0058	0.0049	0.0048	0.028
Opacity[4]	63.1220(a)(7)	I A/ 1, 2, 3	%	10.5	12.7	11.2	NA	20
Opacity[4]	63.1220(a)(7)	I B/ 1, 2, 3	%	10.8	10.7	10.9	NA	20
Opacity[4]	63.1220(a)(7)	II / 1, 2, 3	%	6.0	7.2	6.8	NA	20
SVM	63.1220(a)(3)	I A/ 1, 2, 3	ug/dscm[3]	<5.65	<7.20	<4.61	<5.82	330
SVM	63.1220(a)(3)	I A/ 1, 2, 3	lbs SVM/ MMbtu HWF	$<8.9 \times 10^{-6}$	$<9.9 \times 10^{-6}$	$<7.3 \times 10^{-6}$	$<8.7 \times 10^{-6}$	7.6×10^{-4}
LVM	63.1220(a)(4)	I A/ 1, 2, 3	ug/dscm[3]	<2.95	<3.71	<17.35	<8.00	56
LVM	63.1220(a)(4)	I A/ 1, 2, 3	lbs LVM/ MMbtu HWF	$<4.6 \times 10^{-6}$	$<5.1 \times 10^{-6}$	$<2.7 \times 10^{-5}$	$<1.2 \times 10^{-5}$	2.1×10^{-5}
HCl	63.1220(a)(6)	I A/ 1, 2, 3	ppmv[3]	11.0	5.8	12.1	9.6	120
Cl_2	63.1220(a)(6)	I A/ 1, 2, 3	ppmv[3]	<0.28	<0.30	<0.29	<0.29	120
THC[5]	63.1220(a)(5)	I A/ 1, 2, 3	ppmv[3]	1.1	1.2	1.1	NA	20
THC[5]	63.1220(a)(5)	I B/ 1, 2, 3	ppmv[3]	2.2	3.4	1.3	NA	20
THC[5]	63.1220(a)(5)	II / 1, 2, 3	ppmv[3]	12.3	1.2	1.0	NA	20

[1]1, 2, 4 Trichlorobenzene
[2]Perchloroethylene ("Perc")
[3]Corrected to 7% O_2
[4]Maximum 6-minute block average during the test run. Opacity is not required under HWC MACT since a BLDS is installed and operating on kiln 1
[5]HRA
NA – Not Applicable

2.3 Continuous Monitoring System Performance Evaluation Overview and Results

Subpart EEE, section 63.1209(d) requires Essroc to conduct performance evaluations of affected CMS in accordance with 40 CFR part 63, subpart A, section 63.8(e). As described in the CPT Plan, the affected CMSs were installed, calibrated, and certified in accordance with applicable PSs prior to the CPT to minimize maintenance interruptions and to maintain accurate instrument performance during the CPT. Section 5 and Attachment C identify the CMSs subject to Subpart EEE performance evaluation requirements and the date each of the subject systems' evaluations were completed. Additional details regarding the CMSs performance evaluations, including records documenting the evaluations, are provided in Attachment C.

2.4 Operating Parameter Limits (OPLs)

Subpart EEE, section 63.1209(b) and sections 63.1209(j) through (p) require Essroc to establish a variety of OPLs during the CPT and to operate in compliance with the established OPLs on an ongoing basis to ensure compliance with the applicable Subpart EEE emission standards. CPT runs were completed under two operating conditions to generate the data necessary to establish the required OPLs. Table 2-2 presents a summary of the CPT runs, associated emission standards, and the corresponding operating parameters or standards for which OPLs were established during each test run. These are based on Table 4-2, Testing Objectives, as found in the approved CPT Plan. Table 2-3 presents a summary of the operating limits (emission limits and OPLs) that were established. Table 2-4 presents the alternative operating scenario OPLs based on the Subpart LLL averaging times and requirements.

Table 2-2. Summary of CPT Runs and Associated HAP Emission Limits and DRE Standard Operating Parameters

HAP/ DRE	Parameter/ Emission Standard	Subpart EEE Citation	Test Runs Used To Establish OPLs[1] Condition; Runs
DRE	Chain Zone Temperature (Surrogate for Min. Combustion Chamber Exit Temperature)	63.1209(j)(1)	Condition II, Runs 1, 2, and 3
	Kiln Feed Rate (Surrogate for Production Rate)	63.1209(j)(2)	Condition I A, Runs 1, 2, and 3
	Max. Pumpable and Total WDF Feed Rates	63.1209(j)(3)	Condition I A, Runs 1, 2, and 3
D/F	Max. Baghouse Inlet Temperatures	63.1209(k)(1)(i)	Condition I B, Runs 1, 2, and 3
	Chain Zone Temperature (Surrogate for Min. Combustion Chamber Exit Temperature)	63.1209(k)(2)	Condition II, Runs 1, 2, and 3
	Kiln Feed Rate (Surrogate for Production Rate)	63.1209(k)(3)	Condition I A, Runs 1, 2, and 3
	Max. Pumpable and Total WDF Feed Rates	63.1209(k)(4)	Condition I A, Runs 1, 2, and 3
Hg	Max. Total Hg Feed Rate	63.1209(l)	MTEC[2]
PM	Kiln Feed Rate (Surrogate for Production Rate)	63.1209(m)(2)	Condition I A, Runs 1, 2, and 3
SVM/ LVM	Max. Baghouse Inlet Temperature	63.1209(n)(1)	Condition I A, Runs 1, 2, and 3
	Max. Total SVM Feed Rate	63.1209(n)(2)(iii)(B)	Condition I A, Runs 1, 2, and 3
	Max. Total LVM Feed Rate	63.1209(n)(2)(iii)(B)	Condition I A, Runs 1, 2, and 3
	Max. Pumpable LVM Feed Rate	63.1209(n)(2)(vi)	Condition I A, Runs 1, 2, and 3
	Max. Total Chlorine/Chloride Feed Rate	63.1209(n)(4)	Condition I A, Runs 1, 2, and 3
	Kiln Feed Rate (Surrogate for Production Rate)	63.1209(n)(5)	Condition I A, Runs 1, 2, and 3
HCl/Cl_2	Max. Chlorine/Chloride Feed Rate	63.1209(o)(1)	Condition I A, Runs 1, 2, and 3
	Kiln Feed Rate (Surrogate for Production Rate)	63.1209(o)(2)	Condition I A, Runs 1, 2, and 3

[1]Parameter OPLs set per Table 4-2 of the approved CPT plan and/or based on agency approved alternatives.

[2]Mercury compliance will be demonstrated on an ongoing basis using the maximum theoretical emission concentration (MTEC) as described in 40 CFR 63.1206(b)(14).

Table 2-3. Summary of Operating Limits

Emission Limit/OPL	OPL from CPT
Min. Combustion Chamber Exit Temperature (°F)	1,597
Kiln Feed Rate (surrogate for production) (ton/hr)	86
Max. CWDF Feed Rate (lbs/min)	32.9
Max. LWDF Feed Rate (lbs/min)	451
Max. Total WDF Feed Rate (lbs/min)	484
Max. APCD Inlet Temperature (°F)	397
Max. Opacity[1] (%)	20
Max. THC (ppm)	20
Max. Kiln Differential Pressure (in. H_2O)	0.05
Max. Total Hg Feed Rate (MTEC)(lb/hr)	0.037
Max. Total SVM Feed Rate (% SRE)	99.990
Max. Total SVM Feed Rate (lb/hr)	760
Max. Total LVM Feed Rate (% SRE)	99.996
Max. Total LVM Feed Rate (lb/hr)	320
Max. Pumpable LVM Feed Rate (% SRE)	99.996
Max. Pumpable LVM Feed Rate (lb/hr)	303
Max. Total Chlorine/Chloride Feed Rate (lbs/hr)	384

[1]Opacity is not required under HWC MACT since a BLDS is installed and operating on kiln 1

Table 2-4. Summary of Alternate Operating Scenario Operating Parameter Limits (Subpart LLL)

Emission Limit/OPL	OPL from CPT
Max. APCD Inlet Temperature (°F)	397
Max. Opacity[1] (%)	20

[1]Opacity is not required under HWC MACT since a BLDS is installed and operating on kiln 1

2.5 Other Compliance Documentation Information

Subpart EEE requires Essroc to list the methods that will be used for determining continuing compliance with the applicable standards and operating requirements, including a description of reporting requirements and air pollution control methods in accordance with 40 CFR Part 63, subpart A, sections 63.9(h)(2)(i)(C) and (F). In addition, according to the Preamble to the September 30, 1999 Federal Register notice promulgating the original final Subpart EEE implementation requirements, Essroc must include "other information documenting compliance with the [Subpart EEE] operating requirements, including but not limited to automatic waste feed cutoff system operability and operator training." See 64 FR 189 at p. 52918, col. 2, September 30, 1999. Subpart EEE, section 63.1206(b)(11) also requires Essroc to calculate the hazardous waste residence time for the kiln system and provide it in the NOC. Table 2-5 presents a summary of the CPT report sections that address these issues.

Table 2-5. Summary of Other Compliance Determination Documentation

Emission Limit/OPL	CPT Report Section
Combustion system leaks	4.4.3
Automatic waste feed cutoff system operability	6.3
Calculation of Hazardous Waste Residence Time	9.0
Startup, Shutdown, and Malfunction Plan (SSMP)	10.1
Operator Training and Certification Plan (OTCP)	10.2
Operation and Maintenance Plan (OMP)	10.3
Feedstream Analysis Plan (FAP)	10.4

2.6 Major/Area Source Determination

Subpart EEE requires Essroc to provide an analysis demonstrating whether the affected source is a major source or an area source using the emissions data generated by the CPT in accordance with 40 CFR Part 63, subpart A, section 63.9(h)(2)(i)(E). Test results for hydrochloric acid (HCl) show the facility emits approximately 19.4 tons per year and is therefore classified as a major source facility. The major source classification is determined from Kiln 1 emissions only. Additional details regarding the major/area source analysis are provided in Section 8.0.

2.7 Air Pollution Control Equipment

Subpart EEE requires Essroc to describe the air pollution control equipment (or method) for each emission point, including each control device (or method) for each HAP and the control efficiency for each control device or method in accordance with 40 CFR part 63, subpart A, section 63.9(h)(2)(i)(F). The combustion gases exit each kiln system through an APCD. Kiln 1 exhaust gases enter a new baghouse that contains one compartment with 2160 fiberglass bags with a polyfluorotetraethylene (PTFE) membrane used to clean the dust-laden combustion gases. The cleaned exhaust gases discharge to the atmosphere through a common 204-foot high stack with an exit inside diameter of 15.6 feet. A pulse of plant air is used to loosen the particulates from the bags. The particulates fall into the "V"-shaped bottom sections of the APCD housing where screw conveyors remove the particulates. Table 2-6 provides the technical specifications of the current APCD.

Table 2-6. Current APCD Engineering Specifications

Kiln Designation	Units	Basis	Kiln 1
Manufacturer			Redicam
Plates	Number	Design	NA
Compartments	Number	Design	1
Bags	Number	Design	2160
Total Collection Area	Sq. Feet	Design	272,222
Wires	Number	Design	NA
Airflow Rate	ACFM	Design Max	315,000
		Nominal	225,000

General maintenance procedures for the Kiln 1 APCD is performed during scheduled kiln outages and as needed. Typical maintenance procedures include:

- replacement of broken or damaged bags;
- replacement of broken or damaged bag cages;
- overall inspection of the mechanical components;
- inspection of all pulse jet systems;
- inspection of the door seals; and,
- inspection and replacement (if necessary) of all hatch cover seals.

As part of the APCD system, gas-conditioning systems have been installed in the exit ducting of each kiln. These gas-conditioning systems contain engineered water spray units designed to effectively temper the hot gases from the rotary kiln in order to control the formation of dioxins and furans (D/F). The system can deliver up to 30 gallons per minute of water as needed. Ambient air dampers are also in place to backup the water spray units and provide a secondary means of temperature control.

2.8 Facility Operating Mode Description

As stated in the CPT Plan, Essroc experiences periods of operation when hazardous waste-derived fuel (HWDF) is not being utilized in the kiln system. Operation during these periods is defined as an alternate mode of operation in accordance with 40 CFR 63.1209(q). When the facility is in operation without firing HWDF, Essroc proposes to monitor OPLs only for those parameters that are related to cement manufacturing, as opposed to monitoring all the parameters required for burning hazardous waste. Emissions parameters that are related to cement manufacturing include:

- D/F;
- Particulate matter (PM); and
- Opacity.

The basis for selecting these parameters is the Portland Cement NESHAP requirements, which dictate those parameters that must be monitored while manufacturing cement, as detailed in 40 CFR 63 Subpart LLL.

Essroc proposes to maintain the option to use one of two different procedures to monitor compliance during times when hazardous waste is no longer in the kiln system. First, Essroc proposes to maintain the established OPLs and associated averaging times established during the initial CPT when firing hazardous waste and during the alternate mode, when hazardous waste is not being fired. The OPLs established when firing hazardous waste are equivalent to, or are more stringent than, those that would be established when not firing hazardous waste. In addition, using the more stringent OPLs will eliminate the need to reprogram systems and operate with two different sets of OPLs.

However, Essroc wishes to maintain the option to utilize the alternative operating OPLs as established during the CPT while utilizing the PC NESHAP averaging periods.

2.9 CPT Test Program Description

A total of nine test runs consisting of three operating conditions were performed on Kiln 1 at Essroc's Logansport, Indiana plant during the periods of October 6–10, 2009 and November 4-5, 2009. The test program consisted of three operating conditions. All testing was performed in accordance with the facility's CPT Plan and various approved CPT Plan implementation changes.

Condition I was used to determine the hydrochloric acid/chlorine gas (HCl/Cl_2), PM, and metals emission levels while operating at the maximum production rate, maximum waste-derived fuel feed rate conditions, and maximum chlorine/chloride feed rate. Essroc wished to maximize metal emissions during Condition I, which involved the escalation of the APCD inlet temperature and combustion chamber temperature to levels above normal and beyond the established limits taken in this NOC report. Therefore, D/F testing was moved to an alternative run after consultation and approval by the IDEM. A total of three Condition I test runs were completed.

Condition III was used to determine the D/F emission levels for the kiln system while operating the APCD at its maximum inlet temperature and normal production and waste fuel rates. This condition was added with approval from IDEM based on the need to represent worst-case operations in Condition II. A total of three test runs were completed.

Condition II was used to determine DRE levels while operating at the minimum combustion zone temperature (chain zone temperature) and with production rate and waste feed rate conditions proportional to achieve a minimum combustion zone temperature (chain zone temperature). Three test runs were completed for this test condition.

2.9.1 Program Overview

Essroc operated the kiln to meet the objectives stated in the CPT Plan:

- demonstrate compliance with DRE, PM, D/F, semi-volatile metals (SVM), low volatility metals (LVM), and HCl/Cl_2 emission standards;
- demonstrate compliance with the continuous emission monitoring system (CEMS), continuous opacity monitoring system (COMS), and other CMS-monitored parameter requirements;
- establish OPLs to ensure compliance with the emissions standards under hazardous waste operations and during alternate operating scenarios when hazardous waste is no longer in the system (after the hazardous waste residence time has elapsed); and
- demonstrate compliance with the PSs for each CMS.

2.9.2 Test Program Contractors

The following presents the contractors involved in the execution of the CPT and its reports. Statement of Qualifications (SOQs) are included in Attachment E of this report.

Avogadro Environmental Corporation

Founded in 1995, Avogadro Environmental Corporation (Avogadro) is a full-service environmental testing firm located in Easton, Pennsylvania. Avogadro was responsible for all Condition I emission sampling during the CPT. Avogadro's Jace Shively was the in-field project supervisor for the CPT, and Rian Carr, Cory Weiss, Ed Anderson, and Doug Earls comprised the rest of the emission test team.

B3 Systems

B3 Systems (B3) has provided chemical spiking since 1991 and has successfully conducted over 450 spiking programs. Their personnel have over 40 years combined experience in chemical spiking alone. B3 was responsible for the input of metal and chlorine spike solutions into the liquid waste-derived fuel (LWDF) feedstream during the CPT program. Robert Baxter, Lee Salter, and Ralph Bard were the B3 personnel in the field during Condition I of the CPT, and Ralph Bard was on-site during Condition II.

Schreiber, Yonley & Associates

Founded in 1985, Schreiber, Yonley & Associates (SYA) is a full-service environmental engineering and consulting firm. SYA is widely recognized for its expertise in all aspects of environmental management programs for the cement industry. SYA provided oversight and coordination for the CPT at all stages and is also the External QA Manager for the project. Brad Phillips, Dan Carney, and Tony Schiro of SYA were on-site during Condition I of the testing program, and Brad Phillips and Chuck Kellett were on-site during Condition II.

Weston Solutions, Inc.

Weston Solutions, Inc. (Weston) is a comprehensive environmental, health, and safety consulting and testing company with numerous business divisions dedicated to supporting companies with their environmental health and safety (EHS) needs. Specifically, Weston was responsible for all Condition II emission sampling during the CPT. Weston's Gregory Sims was the project manager for the CPT, and Jack Mills, A.J. Veith, Mark Fowler, and Logan Waites comprised the rest of the emission test team.

2.9.3 Analytical Contractors

The following section presents the contractors responsible for the analytical laboratory services for the CPT. SOQs from these companies are also included in Attachment E.

Environmental Labs and Services, Inc.

Environmental Labs and Services, Inc. (ELS) is an environmental laboratory company specializing in providing analytical and consulting support to industrial facilities. ELS offers central and on-site analytical services for companies that do not wish to establish laboratory operations of their own. ELS provides on-site laboratory services for Essroc, as well as providing commercial independent analytical testing in its Pennsylvania facility. ELS provided all analytic services for the process samples collected during the testing.

Maxxam Analytics, Inc.

Maxxam Analytics, Inc. (Maxxam) is one of the largest independently owned analytical laboratory networks in North America. Maxxam provides independent and objective analytical testing services to government and major companies in a variety of industries. Maxxam completed all stack emission analytical testing for both Avogadro and Weston.

2.9.4 Summary of Test Program Correspondence

The CPT Plan was originally submitted to both IDEM and EPA on October 10, 2008. Since that time, communication has taken place via email, letters, and conversations between Essroc and the regulatory agencies. The correspondence includes requested revisions to the CPT Plan in May and August of 2009 and several exchanges addressing requested waivers and requests for alternative monitoring procedures. A summary of this information is contained in Attachment B of this report.

2.10 Summary of Alternate Compliance Monitoring Methods

This section summarizes the alternative compliance monitoring methods requested by Essroc and the status of those requests. As part of the CPT Plan submitted on October 10, 2008, one alternative monitoring method request and three waiver requests were made.

In summary, Essroc sought approval of the following:

- Essroc requested to only monitor certain OPLs that are related to cement manufacturing, as opposed to monitoring all the parameters required for burning hazardous waste, at times when hazardous waste in not being burned in the kiln. During this alternate mode of operation, the facility proposes to monitor D/F, PM, and opacity OPLs, as required by the Portland Cement NESHAP.

  Essroc proposed to maintain the established OPLs and associated averaging times established during the initial CPT when firing hazardous waste and during the alternate mode, when hazardous waste is not being fired. However, Essroc wished to maintain the option to utilize the alternative operating OPLs as established during the CPT while utilizing the PC NESHAP averaging periods. The request is detailed in Section 6.1 of the CPT Plan.

- Essroc requested a waiver of monitoring constituents in certain feed streams as specified by 40 CFR 63.1209(c)(5). The feed streams in question include process air and APCD inlet conditioning system water sprays. Due to the insignificant concentration of metal and chlorine in these feed streams, it has been determined that the exclusion of these streams from monitoring will have no effect on the test results and facility compliance programs. The request is detailed in Section 6.2 of the CPT Plan.

- Essroc requested a waiver of the one-year test plan notification requirement under the HWC MACT. The request is detailed in Section 6.3 of the CPT Plan.

- Essroc requested a data-in-lieu waiver to test only one of the two kilns at the facility. This request was later withdrawn because Kiln 2 still uses an electrostatic precipitator (ESP), while Kiln 1 now uses a baghouse. The request is detailed in Section 6.4 of the CPT Plan.

The EPA sent a response on May 26, 2009 approving the first three requests. As stated previously, the fourth request was withdrawn by Essroc. Additionally, Essroc has requested a one-year extension from testing Kiln 2 due to its minimal operation. This request was submitted to EPA Region 5, with a copy sent to IDEM, on June 30, 2009, and it was approved.

2.11 Compliance Statement

Subpart EEE requires Essroc to include a statement by the owner or operator of the affected source as to whether the source has complied with the applicable Subpart EEE requirements in accordance with 40 CFR part 63, subpart A, section 63.9(h)(2)(i)(G). Essroc's compliance statement (page i) is provided among the cover documents.

3.0 SAMPLING, ANALYSIS, AND MONITORING METHODS

3.1 Introduction

Subpart EEE requires Essroc to list the following information in accordance with 40 CFR Part 63, subpart A, sections 63.9(h)(2)(i)(A), (B), and (D):

- methods that were used to determine compliance;
- results of any performance tests, opacity or visible emission observations, CMS performance evaluations, and other monitoring procedures or methods that were conducted; and,
- type and quantity of HAPs emitted by the affected source (or surrogate pollutants, e.g., DRE, if specified in the relevant standard).

This section addresses the CPT sampling, analysis, and monitoring methods conducted, and the corresponding results obtained, in accordance with the facility's CPT Plan and Quality Assurance Project Plan (QAPP). Detailed information regarding any deviations from the methods set forth in the CPT Plan and QAPP is provided in Section 7.5.

3.2 Establishment of Steady State Operations

3.2.1 Objective

Subpart EEE, section 63.1207(g)(1)(iii) requires that, prior to obtaining performance test data, Essroc operate the kiln system under performance test conditions until it reaches steady-state operations with respect to emissions of pollutants to be measured during the performance test and operating parameters for which OPLs must be established. The following sections describe the procedure Essroc used to establish steady-state operations and documents its achievement.

3.2.2 Procedure

As proposed in the facility's CPT Plan, spiking of lead, chromium, and chlorine solutions into the LWDF and containerized waste-derived fuel (CWDF) being fed to the kiln system began at least 5 hours in advance of the start of the first test run.

For Condition I testing, equilibrium for metals was established prior to commencing the CPT stack gas sampling by spiking lead, chrome, and chlorine solutions into the LWDF just prior to the burner lance. A lead acetate solution, sodium dichromate solution, and perchloroethylene were spiked into the LWDF lance. Results of chemical analyses of cement kiln dust (CKD) generated during this pretest period were used to track the concentration of elemental lead as an indicator of the establishment of steady-state operations. The concentration of lead in the CKD was used as an indicator because it theoretically takes longer to exit the kiln system than organic compounds (due to its higher melting point) and its concentration is easily measured in the CKD. The lead concentration was used to derive the output, which was plotted versus time to determine when steady state is achieved.

In Condition II, the LWDF and CWDF feedstreams were each spiked with a chlorinated compound (perchloroethylene and 1,2,4-trichlorobenzene, respectively). Adequate time was allowed to ensure that the system's residence time (<24 seconds) was achieved for organic DRE. Typically, testing was not started until at least thirty minutes after spiking began.

3.2.3 Demonstration

As previously stated, prior to any test runs, metal or chlorine spiking solutions were fed into the kiln system to establish a steady-state condition. The input rates during this "conditioning period" were equivalent to that used during the actual emissions testing.

Grab samples were collected periodically (30-minute intervals) from the CKD stream for use in demonstrating steady-state condition. Plots of the output concentration were developed for lead. As described in the CPT Plan, steady-state is achieved once three consecutive constituent concentrations of lead show to be within 15 percent of the previous sample value. Based on this criterion, steady state for subsequent metals runs will occur after 5:57 from the initiation of metals spiking.

Table 3-1. Steady State Demonstration Summary

Condition	Run	Spike Material	Spike Start Date	Spike Start Time	Run Start Date	Run Start Time	Elapsed Spiking Time	Steady State Achieved
I	1	Metals	10/6/09	03:22	10/6/09	17:30	14:08	Yes
	1	Chlorine	10/6/09	06:11	10/6/09	17:30	11:19	Yes
	2	Metals	10/6/09	03:22	10/6/09	22:50	19:28	Yes
	2	Chlorine	10/6/09	06:11	10/6/09	22:50	16:39	Yes
	3	Metals	10/6/09	03:22	10/7/09	10:45	31:23	Yes
	3	Chlorine	10/6/09	06:11	10/7/09	10:45	28:34	Yes
	Minimum Time to Achieve Equilibrium – Condition I					5:57		
II	1	TCB	11/4/09	07:54	11/4/09	08:50	00:56	Yes
	1	Perc	11/4/09	07:46	11/4/09	08:50	01:04	Yes
	2	TCB	11/5/09	04:09	11/5/09	05:31	01:12	Yes
	2	Perc	11/5/09	04:38	11/5/09	05:31	00:53	Yes
	3	TCB	11/5/09	15:43	11/5/09	16:50	01:07	Yes
	3	Perc	11/5/09	04:38	11/5/09	16:50	12:12	Yes

All of the test runs were conducted at least 6 hours after spiking began for Condition I and greater than 30 minutes for Condition II. Data documenting the establishment of steady-state conditions is included in Attachment F.

3.3 Process Input Sampling

In addition to stack emissions, samples of input (kiln feed, solid fossil fuels, LWDF, CWDF, and off-spec oil/used oil) were taken during the CPT to determine certain constituent inputs to the kiln for Conditions I and II. No process samples were taken during Condition III since constituent concentrations were not relevant to that testing program. A brief summary of the procedures is included in the following subsections. The analytical results are found in Attachment G of this report.

3.3.1 Kiln Feed

Samples of kiln feed (slurry) were drawn by Essroc personnel from the designated piping and gate valve following the feed pump to the kiln in the slurry mixing and storage tank building. A 500-mL glass sample jar was utilized to obtain grab samples at 1-hour intervals and subsequently labeled with the material, sample location, condition number, run number, and time. At the conclusion of each run, equal amounts from each grab sample were combined and thoroughly mixed in a 2.5-L glass sample jar to produce a composite sample for the run. The composite samples were divided into two fractions. One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary.

3.3.2 Fossil Fuels (Coal/Petroleum Coke)

Samples of the solid fossil fuel were taken by Essroc personnel at the feed belt preceding the coal mill on the burner floor. A steel scoop was used to collect the grab samples, which were placed into 500-mL glass sample jars, at 1-hour intervals. At the end of each run, equal amounts from each grab sample were combined and thoroughly mixed in a 2.5-L glass sample jar to produce a composite sample for the run. If solid fuel was not being fired in the kiln during the 1-hour interval, no sample was taken. The composite samples were divided into two fractions. One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary.

3.3.3 Liquid Hazardous Waste-Derived Fuels

Essroc personnel took samples of LWDF from the LWDF feed loop pump prior to spike injection. The samples were collected in a 500-mL glass jar at 1/2-hour intervals and subsequently labeled with the material, sample location, condition number, run number, and time. At the conclusion of each run, equal amounts from each grab sample were combined and thoroughly mixed in a 2.5-L glass sample jar to produce a composite sample for the run. The composite samples were divided into two fractions. One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary.

3.3.4 Containerized Hazardous Waste-Derived Fuels

Essroc personnel took samples of CWDF from the injection platform at the mid-kiln location. A representative pail of CWDF was set aside at 1/2-hour intervals throughout each test period. At the conclusion of each run, core samples were drawn from each pail and composited into a 5-gallon bucket. Each composite sample was divided into two fractions in 2.5-L jars and labeled and stored as directed in the CPT Plan (QAPP). One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary.

3.3.5 Off-Spec Oil/Used Oil/Diesel Fuel

Essroc personnel took samples of off-spec oil, used oil, and diesel fuel at each respective feed line prior to spike injection during periods when one of these inputs was being fired in the kiln. The samples were collected in a 500-mL glass jar at 1/2-hour intervals and subsequently labeled with the material, sample location, condition number, run number, and time. At the conclusion of each run, equal amounts from each grab sample were combined and thoroughly mixed in a 2.5-L glass sample jar to produce a composite sample for the run. The composite samples were divided into two fractions. One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary.

3.3.6 Conditioning Tower Water

As discussed in the CPT, conditioning water was not monitored during the test because this input stream does not contain significant quantities of HWC NESHAP constituents of concern.

3.3.7 Spiking Materials

During the CPT, certain materials were spiked into the CWDF and LWDF feedsteams. Laboratory assay analyses for the spiking materials attesting to their concentrations were used to develop input levels for all spiking materials and can be found in Attachment H of this report.

During Condition I of the CPT, liquid solutions of lead nitrate, sodium dichromate, and perchloroethylene were metered into the LWDF feedline, just prior to the burner lance.

Condition II testing was designed to verify the DRE of the kiln system. A liquid solution of perchloroethylene was metered into the LWDF feedline in the same manner as in Condition I. During Condition II, containers of 1,2,4-trichlorobenzene were also fed with the CWDF injection system. The individual containers were attached to CWDF pails as they were injected into the kiln.

Additional details regarding the spiking activity are provided in the CPT spiking report located in Attachment H of this report.

3.4 Process Output Sampling

Samples of kiln outputs (clinker and CKD) were also taken to provide additional information for the CPT. A brief summary of the procedures is included in the following subsections. The analyses for these samples are found in Attachment G of this report.

3.4.1 Clinker

Clinker samples were taken by Essroc personnel from the conveyor belt that takes clinker from the cooler to storage. At 1-hour intervals, a metal scoop was used to collect clinker samples in a 1-gallon pail that was subsequently labeled with the material, sample location, condition number, run number, and time. Once the run concluded and the samples cooled, equal amounts from each grab sample were combined in a 1-gallon pail and then ground up to produce a composite sample for the run. The composite samples were divided into two fractions. One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary. Additionally, the second fraction was analyzed for cement chemistry to ensure that the kiln was producing product at the time of the test runs.

3.4.2 Cement Kiln Dust

CKD samples were collected from the transfer pipe to the waste dust tank at 1-hour intervals. The sample was collected via metal scoop and deposited directly into a 1-gallon bucket that was subsequently labeled with the material, sample location, condition number, run number, and time. Once the run concluded and the samples cooled, equal amounts from each grab sample were combined and thoroughly mixed in a 2.5-L glass sample jar to produce a composite sample for the run. The composite samples were divided into two fractions. One fraction was forwarded to the appropriate laboratory for analysis, and the second fraction was archived for later analysis, if necessary.

3.5 Process Monitoring

This section describes other process monitoring methods and equipment (i.e., CMSs) Essroc used to monitor the process during the CPT. Compliance with applicable CMS PSs and evaluation requirements is addressed in Section 5.0. The OPLs (e.g., feedstream flow rate limits) established as a result of the process monitoring and associated CPT runs are addressed in Section 4.0. The data for these parameters are found by test run in Attachment D.

3.5.1 Air Pollution Control Device (Baghouse) Inlet Temperature

The gas temperature at the inlet of the APCD was measured after the water spray conditioning system and just prior to the entrance of the APCD. As required in 40 CFR 63.1209 (k)(1), a thermocouple system was used to measure the temperature. The equipment installed at this location is a W.H. Cooke model 73219, Type T thermocouple. Ambient air dampers are also in place to backup the water spray units and provide a secondary means of temperature control. These dampers are also located prior to the thermocouple.

3.5.2 Combustion Zone Temperature

Two combustion zones are present in the Essroc kiln system: the rotary kiln burning zone for LWDF and the mid-kiln area for CWDF. Since there is no reliable method for directly measuring gas temperatures in the burning zone of the rotary kiln where the gas temperature is approximately 3,200°F, and the mid-zone thermocouple measures kiln feed material temperature, an alternative location is needed. Therefore, to comply with the provisions of 40 CFR 63.1209(j)(1) and (k)(2), the nearest gas temperature measurement location is the chain zone temperature thermocouple. This location was chosen as the surrogate for both combustion chamber temperatures. During the CPT, a Richards model 8K2-60, Type K thermocouple was used to measure temperature.

3.5.3 Kiln Differential Pressure

To control fugitive emissions from the kiln system in accordance with section 63.1206(c)(5)(i)(B) of Subpart EEE, the kiln induced-draft (ID) fan draws air through the rotary kiln, keeping the system under negative pressure. To monitor the pressure and ensure it remains negative, gas pressures at the kiln firing hood and kiln feed end are measured. The differential pressure between these two measurements ensures the flow is consistently toward the stack and the system is controlling fugitive emissions. Foxboro model 14B pressure transmitters were used to measure pressure at these locations during the CPT.

3.5.4 Production Rate (Flue Gas Flow Rate or Kiln Feed Rate)

As described in 40 CFR 63.1209 for several emission parameters, the kiln system production rate must be monitored. Since direct measurement of production is not practical for cement manufacturing facilities, this parameter must be measured through the use of a surrogate. The monitoring surrogate can be either flue gas flow rate or kiln feed (slurry) rate. Both parameters are accurate measures of the kiln system production rate.

The kiln's ID fan draws air through the kiln to ensure adequate combustion air is present for the fuels. This air is pulled from the combustion zone of the kiln through the kiln APCD and is exhausted through the stack. As the production rate is increased, more fuel is used to produce clinker. As more fuel is used, more combustion air is needed. In cement kilns, these parameters are very interdependent. The flue gas flow rate is measured both, 1) in the ductwork after the kiln ID fan by an ultrasonic gas flow meter; and, 2) by direct ID fan amperage.

Kiln feed rate is also used as a surrogate for production rate. The slurry is measured in wet gallons/minute using a mass flow meter; then, corrected to dry kiln feed tons/hour using an average moisture content of slurry.

For this CPT, kiln feed (i.e. slurry) rate was the OPL set for compliance; however, ID fan amps may be used as a backup surrogate parameter to kiln feed, if needed. A Foxboro model 9653-C magnetic flow meter was used during the CPT to measure the kiln feed rate.

3.5.5 Solid Fossil Fuel Flow Rate

Solid fossil fuel is monitored by use of the weigh belt conveyor that feeds the coal mill. The conveyor belt that transfers the fossil fuel to the mill possesses a load cell that weighs the amount of material on the belt less the belt and system weight. Based on a preset length of belt, a material depth, and belt speed, the mass input rate is calculated in the programmable logic controller (PLC). The equipment used during the CPT was a Merrick Auto-Weigh Micro VI conveyor belt.

3.5.6 Liquid Hazardous Waste-Derived Fuel Rate

LWDF is pumped from the storage tank farm or directly from transport vehicles through a continuous loop to the burner floor and back into the tank farm. From the loop at the burner floor, control valves allow a set amount of LWDF to flow into the kiln's burner lance. This flow is measured with a coriolis mass flow meter as it is fed into the kiln. During the CPT, a Micro-Motion model DL1005223 mass flow meter monitored LWDF feed rates.

3.5.7 Containerized Hazardous Waste-Derived Fuel Rate

Like the solid fossil fuel, the CWDF uses a weigh belt conveyor to measure the weight of each pail/container injected into the kiln. This weight is used by the PLC to calculate the time interval between the delivery of each pail into the kiln using a pail carriage system, thus giving a mass flow rate. A Toledo model 2197 auto-weigh scale determined the weight of each container during the CPT.

3.5.8 Off-Specification Used Oil/Non-Hazardous Liquid Fuel

Off-specification used oil and other non-hazardous liquid fuels are processed through a separate tank system from the LWDF system and fired to the kiln through a flow meter and into the multi-channel burner pipe located in the kiln's firing hood.

3.5.9 Other Fossil Fuel

No. 2 fuel oil and/or diesel fuel is drawn from on-site storage tanks to the kilns through a mass flow meter. However, this fuel was not used during the testing.

3.5.10 Spiking Material Rate

Spiking material input rates were measured and recorded using a various speed metering pump, mass flow meter, and a PLC connected to a computer control system. This system is described in Attachment H, B3 Systems Spiking Report.

3.6 Stack Gas Sampling and Analysis

The following sections describe the stack sampling and analytical methods used to conduct the CPT. The details of each test method and the results of the emissions testing are found in the Avogadro and Weston reports included in Attachments I and J of this report.

3.6.1 Stack Sampling Location

The stack gas samples were collected for the CPT at the exhaust breeching duct of Kiln 1, which extends from the APCD outlet to the common main stack. The breeching duct is square with dimensions of 96 inches by 96 inches. The sampling location is approximately 39 feet above the ground. A total of 7 sampling ports are present on the duct, but only 4 were used for testing.

3.6.2 Stack Sampling Point Determination

The sampling ports on the breeching duct are located 44 feet, 8 inches (5.6 diameters) downstream of a flow disturbance and 22 feet, 10 inches (2.9 diameters) upstream from a flow disturbance. This location meets the minimum requirements of EPA Method 1 for velocity traverses. A total of 20 traverse points in a 5 by 4 matrix were used for sampling.

3.6.3 Stack Velocity and Volumetric Flow Rate Determination

The stack-gas velocity and the volumetric flow rate determinations were made in accordance with the EPA Reference Method 2 procedures. Velocity was measured during each test run with a calibrated Pitot tube and oil-filled manometer. The results of the stack-gas velocity and volumetric flow rate determinations are summarized in Table 4-1.

Differential pressures and effluent gas temperatures were also measured in accordance with the procedures in EPA Reference Method 2 and the CPT Plan.

3.6.4 Stack Gas Moisture Determination

Stack-gas moisture content was determined in accordance with the procedures outlined in the CPT Plan and EPA Reference Method 4. The results of the moisture determinations are included in Table 4-2.

3.6.5 Dioxins and Furans

The concentration of D/F in the stack gas was determined for each test condition using the SW-846 Method 0023A stack sampling procedures. Test runs were 180 minutes in duration, which equated to sampling 9 minutes at each traverse point. A total of three test runs were performed under Condition III. Samples were analyzed according to SW-846 Method 8290. Results from the CPT are presented in Table 4-3.

3.6.6 Multi-Metals

The concentrations of LVM and SVM in the stack gas were determined during Condition I of the CPT using the EPA Reference Method 29 stack sampling procedures (see 40 CFR Part 60, Appendix A). Test runs were 120 minutes in duration. Samples were prepared and analyzed in accordance with SW-846 Methods 6010C, 7060/7740/7841, and 7470A. Results from the CPT are presented in Tables 4-4 and 4-5.

3.6.7 Hydrochloric Acid and Chlorine Gas

The concentrations of HCl and Cl_2 in the stack gas were determined during Condition I of the CPT using the EPA Reference Method 26A stack sampling procedures (see 40 CFR Part 60, Appendix A). Test runs were 120 minutes in duration. Samples were prepared and analyzed in accordance with SW-846 Method 9212 and ASTM Method D808. Results from the CPT are presented in Table 4-7.

3.6.8 Particulate Matter

The concentration of PM in the stack gas was determined during Condition I of the CPT using the EPA Reference Method 5 stack gas sampling procedures (see 40 CFR Part 60, Appendix A). Test runs were 120 minutes in duration. Samples were prepared and analyzed in accordance with EPA Method 5. Results from the CPT are presented in Table 4-8.

3.6.9 Volatile Organic Constituents

In order to determine the DRE of the kiln system, two separate emissions sampling and analysis trains were utilized, a Volatile Organic Sampling Train (VOST) and a Semi-Volatile Organic Sampling Train (SVOST). This section identifies the sampling and analysis methods used in conjunction with the VOST, and Section 3.6.10 identifies the SVOST methods.

The VOST stack gas sampling was conducted during Condition II of the CPT using SW-846 Method 0030. Sample preparation and analysis was completed using SW-846 Method 8240. Additional details regarding the DRE compliance determination and results are provided in Attachment D.

3.6.10 Semi-Volatile Organic Constituents

The SVOST stack gas sampling was conducted during Condition II of the CPT using SW-846 Method 0010. Sample preparation and analysis was completed using SW-846 Method 8270C. Additional details regarding the DRE compliance determination and results are provided in Attachment D.

3.7 Stack Gas Monitoring

Subpart EEE, section 63.1209(a) requires Essroc to use hydrocarbon, oxygen, bag leak detector, and opacity stack gas monitoring systems:

This section describes the stack gas monitoring systems used to demonstrate compliance with applicable Subpart EEE requirements during the CPT. Separate CEMS at the facility monitor total hydrocarbons (THC) and oxygen (O_2) for each kiln system. Each THC system is designed to extract a representative sample of stack gas and provide continuous analyses of this constituent. Each system filters the stack gas and transports it to the THC analyzer, maintaining the temperature of the gas above the dew point to prevent condensation.

Compliance with applicable PSs and evaluation requirements for these systems is addressed in Section 5.0. The OPLs established as a result of the stack gas monitoring and associated CPT runs are addressed in Section 4.0.

3.7.1 Hydrocarbons

Each kiln system is equipped with a THC extraction and analyzing system. Each THC system is designed to extract a representative sample of stack gas and provide continuous analyses of this constituent. Each system filters the stack gas and transports it to the THC analyzer, maintaining the temperature of the gas above the dew point to prevent condensation.

Key components of the THC analyzer are:

- sample probe with heated external filter;
- heated sample transport line;
- gas analyzer;
- flow controllers, valves, etc.;
- programmable logic controller (PLC controls internal CEMS functions);

- calibration gas cylinders; and,
- computer (for long-term data storage).

The specific THC monitors used are Rosemount Analytical model 402 and 402RS flame ionization detectors. The periodic calibration for this unit is defined in 40 CFR Part 60, Appendix B, Performance Specification 8A (PS8A).

3.7.2 Oxygen

The Yokogawa ZA8C In-Situ Type Zirconia Oxygen Analyzer is used to monitor the oxygen concentration in combustion gases of cement kilns. The low temperature detector is a direct insertion (in-situ) type oxygen detector. A zirconia cell maintained by an internal heater at 1,382°F (750°C) is the measuring sensor. The cell (sensor) at the tip of the detector is made of ceramic (zirconia). The heater is made of a quartz-type material. The analyzer consists of a detector, converter, and calibration unit. The periodic calibration for this unit is defined in 40 CFR Part 60, Appendix B, Performance Specification 3 (PS3).

3.7.3 Opacity

A COMS continuously monitors opacity for each kiln system. The key components of the COMS are:

- transmissometer;
- PLC;
- air lines, valves, etc. (for automatic blowbacks); and,
- computer (for long-term data storage).

The COMS is a United Sciences, Inc. model number 550C opacity monitor. The unit is a double-pass transmissometer with automatic dust correction and a daily calibration system that uses certified filters as defined in 40 CFR Part 60, Appendix B, Performance Specification 1 (PS1). The opacity monitor remains a current requirement under the Title V permit, however, it is not required under the HWC MACT provisions since a bag leak detector system has been installed and certified.

3.7.4 Bag Leak Detector System (BLDS)

A BLDS continuously monitors for excessive dust emissions from the kiln 1 baghouse. The BLDS uses Auburn Systems, LLC, TRIBOGUARD II, Model 4002 detection probes.

4.0 REGULATORY COMPLIANCE DETERMINATION AND OPERATING PARAMETER LIMITS

4.1 Introduction

The following sections present the results from the performance testing on the Kiln 1 system for the Subpart EEE required emission limits and OPLs.

4.2 Stack Sampling Location

During the CPT, stack gas samples were collected at the exhaust breeching duct, which extends from the APCD outlet to the common main stack. The breeching duct is square with dimensions of 96 inches by 96 inches. The sampling location is approximately 5.6 equivalent duct diameters downstream of a bend and 2.9 equivalent duct diameters upstream of another bend. A total of 7 sampling ports are present on the duct (only 4 of which were used for testing), which resulted in a 5 by 4 traverse point matrix, for a total of 20 points.

4.3 Stack Emission Compliance

The following subsections detail the stack emission results and compliance with the Subpart EEE parameter limits.

4.3.1 Cyclonic Flow Determinations

Prior to testing, a preliminary velocity traverse was conducted by measuring temperature and velocity at each traverse point as determined by EPA Reference Method 1. A cyclonic flow check was also completed at each point during the traverses. If the average flow angle is greater than 20 degrees, the flow conditions in the stack are considered unacceptable, and alternate methodology would be required. The average angle of flow was determined to be acceptable by Avogadro Environmental.

4.3.2 Velocity and Volumetric Flow Rates

The stack-gas velocity and the volumetric flow rate determinations were made in accordance with the EPA Reference Method 2 procedures. Velocity was measured during each test run in Condition I by two sampling trains (Method 5/26A and Method 29. During Condition III, the measurement was completed during each test run by the Method 0023A sample trains. During Condition II testing, velocity was measured with the Method 0010 semivolatile organics sample trains. The results of the stack-gas volumetric flow rate determinations are presented in Table 4-1.

Table 4-1. Volumetric Flow Rate Results

Sampling Train – Condition I	**1**	**2**	**3**	**Average**
Method 5/26A				
Flow Rate (ACFM)	197,728	210,110	203,376	203,738
Flow Rate (DSCFM)[1]	77,892	84,181	78,364	80,146
Method 29				
Flow Rate (ACFM)	206,209	211,149	212,398	209,919
Flow Rate (DSCFM)[1]	78,902	82,522	87,170	82,865
Sampling Train – Condition III	**1**	**2**	**3**	**Average**
Method 0023A				
Flow Rate (ACFM)	171,681	178,257	170,007	173,315
Flow Rate (DSCFM)[1]	72,933	74,431	73,619	73,661
Sampling Train – Condition II	**1**	**2**	**3**	**Average**
Method 0010				
Flow Rate (ACFM)	139,543	150,610	151,601	147,251
Flow Rate (DSCFM)[1]	64,556	70,675	72,738	69,323
Minimum Flow Rate (ASCFM) from all runs	139,543			
Minimum Flow Rate (DSCFM)[1] from all runs	64,556			

[1]29.92 "Hg, 68 Degrees F (760 mm Hg, 20°C)

4.3.3 Stack Gas Moisture

Stack-gas moisture content was determined in accordance with the procedures outlined in EPA Reference Method 4. The results of the moisture determinations are presented in Table 4-2.

Table 4-2. Stack Gas Moisture Results

Sampling Train – Condition I	**1**	**2**	**3**	**Average**
Method 5/26A (%)	35.37	34.37	37.63	35.79
Method 29 (%)	37.16	36.10	33.64	35.63
Sampling Train – Condition III	**1**	**2**	**3**	**Average**
Method 0023A (%)	31.17	33.00	30.46	31.54
Sampling Train – Condition II	**1**	**2**	**3**	**Average**
Method 0010 (%)	31.3	31.5	30.7	31.2

4.3.4 Dioxins and Furans

The concentration of D/F in the stack gas was determined for each test condition using the SW-846 Method 0023A stack sampling procedures. Samples were collected and analyzed according to SW-846 Method 8290. A total of three test runs were performed for each condition. Table 4-3 presents the measured emissions for each test run.

The Condition I phase of the test was conducted at APCD inlet temperatures below 400°F, which requires compliance with the D/F Subpart EEE regulatory limit of 0.4 ng/dscm.

Table 4-3. Dioxin and Furan Emission Results

Condition III	1	2	3	Average
Method 0023A				
Date	10/9/09	10/10/09	10/10/09	-----
Time	16:45-20:00	08:05-11:27	12:30-15:49	-----
Total D/F TEQ (ng/dscm @ 7% O_2)	<4.85E-02	<3.27E-02	<2.54E-02	<3.55E-02

4.3.5 Semi-Volatility Metals

The concentrations of SVMs in the stack gas were determined during Condition I of the CPT using the EPA Reference Method 29 stack sampling procedures (see 40 CFR Part 60, Appendix A). Table 4-4 presents the measured emissions for each test run. The results demonstrate compliance with the Subpart EEE standard of 330 ug/dscm of SVM stack gas emissions.

Table 4-4. Semi-Volatile Metals Emission Results

Condition I	1	2	3	Average
Method 29				
Date	10/6/09	10/6-7/09	10/7/09	-----
Time	17:30-20:09	22:50-01:18	10:45-13:03	-----
Total ug/dscm @ 7% O_2	<5.65	<7.20	<4.61	<5.82

For the system removal efficiency (SRE) calculation only the spiked metal was used due to non-detect value issues. For the SRE, non-detect inputs were assumed to be zero for the calculation.

4.3.6 Low Volatile Metals

The concentrations of LVMs in the stack gas were determined during Condition I of the CPT using the EPA Reference Method 29 stack sampling procedures (see 40 CFR Part 60, Appendix A). METCO performed the stack gas sampling activities and Severn Trent Laboratories, Inc. completed the analytical evaluation of the samples. Table 4-5 presents the measured emissions for each test run. The results demonstrate compliance with the Subpart EEE standard of 56 ug/dscm of LVM stack gas emissions.

Table 4-5. Low Volatility Metals Emission Results

Condition I	1	2	3	Average
Method 29				
Date	10/6/09	10/6-7/09	10/7/09	-----
Time	17:30-20:09	22:50-01:18	10:45-13:03	-----
Total ug/dscm @ 7% O_2	<2.95	<3.71	<17.35	<8.00

For the SRE calculation only the spiked metal was used due to non-detect value issues. For the SRE, non-detect inputs were assumed to be zero for the calculation.

4.3.7 System Removal Efficiency

SREs for certain spiked compounds are used to predict emission rates of SVMs and LVMs during ongoing operations in accordance with the FAP. Using the emission rates of the selected metals measured during the CPT (chromium for LVM and lead for SVM) along with the process input rates of these metals, an SRE was calculated for each species. Process input streams are discussed in Section 3.3. Table 4-6 presents the calculated SREs for each metal constituent for each test run.

Table 4-6. System Removal Efficiencies

Condition I	1	2	3	Average
Low Volatility Metals				
Chromium	99.999%	99.999%	99.990%	99.996%
Semi-Volatile Metals				
Lead	99.990%	99.988%	99.992%	99.990%

4.3.8 Hydrochloric Acid and Chlorine Gas

The concentrations of HCl and Cl_2 in the stack gas were determined during Condition I of the CPT using the EPA Reference Method 26A stack sampling procedures (see 40 CFR Part 60, Appendix A). Samples were prepared and analyzed in accordance with SW-846 Method 9057 and EPA Method 26A. Table 4-7 presents the measured emissions for each test run. The results demonstrate compliance with the Subpart EEE standard of 120 ppm of HCl/Cl_2 (as HCl equivalents) in stack gas emissions.

Table 4-7. HCl/Cl_2 Performance Test Results

Run Number – Condition I	1	2	3	Average
Date	10/6/09	10/6-7/09	10/7/09	-----
Time	17:30-20:10	22:50-01:19	10:45-13:02	-----
HCl Emissions (ppm-dry)[1]	11.0	5.8	12.1	9.6
Cl_2 Emissions (ppm-dry)[1]	<0.28	<0.30	<0.29	<0.29
Total HCl/Cl_2 as HCl Emissions (ppm-dry)[1]	<11.6	<6.4	<12.7	<10.3

[1]29.92 "Hg, 68 Degrees F (760 mm Hg, 20°C)

4.3.9 Particulate Matter

The concentration of PM in the stack gas was determined during Condition I of the CPT using the EPA Reference Method 5 stack gas sampling procedures (see 40 CFR Part 60, Appendix A). Samples were prepared and analyzed in accordance with EPA Method 5 and the results are presented in Table 4-8. The results demonstrate compliance with the Subpart EEE standard of 0.028 gr/dscf.

Table 4-8. PM Performance Test Results

Run Number – Condition I	1	2	3	Average
Date	10/6/09	10/6-7/09	10/7/09	-----
Time	17:30-20:10	22:50-01:19	10:45-13:02	-----
PM Emissions				
grains/dscf[1] @ 7% O_2	0.0036	0.0058	0.0049	0.0048
lbs/hr	2.27	3.70	3.05	3.01
Raw Material Mix Feed (tph)	65.5	66.2	65.7	65.8
kg/Mg of Raw Material Mix	0.017	0.028	0.023	0.023

[1]29.92 "Hg, 68 Degrees F (760 mm Hg, 20°C)

4.3.10 Opacity

A COMS is installed on each kiln system in the ductwork between the exit of the APCD and the common stack. Each COMS is a double-pass transmissometer that continuously reads opacity and records the data as a 6-minute block average. The COMSs have been certified in accordance with PS1. Ongoing maintenance and calibration procedures are performed in accordance with manufacturer's recommendations as detailed in the operations manuals and PS1. The procedures are documented and recorded on site in accordance with the operation and maintenance provisions of the HWC NESHAP regulations. Section 5.0 contains information detailing the performance evaluations of the COMS system. Essroc elected to use this certified COMS to measure opacity during the CPT in lieu of any visual emission readings per EPA Reference Method 9 of 40 CFR Part 60, Appendix A. Opacity data from the COMS system is submitted quarterly to

IDEM. It is noted that opacity is not required under the HWC NESHAP requirements since a certified BLDS is installed and operating on kiln 1.

Table 4-9. Continuous Opacity Readings

Condition I	**1**	**2**	**3**
Maximum (6 minute average)	10.5	12.7	11.2
Condition III	**1**	**2**	**3**
Maximum (6 minute average)	10.8	10.7	10.9
Condition II	**1**	**2**	**3**
Maximum (6 minute average)	6.0	7.2	6.8

4.3.11 Destruction and Removal Efficiency

In order to determine the DRE of the kiln system, a VOST and an SVOST were used to collect stack gas samples to determine principle organic hazardous constituent (POHC) emissions. Two POHCs were spiked to demonstrate DRE, one volatile organic compound (perchloroethylene or "perc") and one semi-volatile compound (1,2,4-trichlorobenzene or TCB). Sections 3.6.9 and 3.6.10 identify the specific sampling and analysis methods for the testing. Table 4-10 presents the calculated DREs for each spiked organic constituent for each test run. The results demonstrate compliance with the Subpart EEE standard of a minimum DRE of 99.99% since Essroc does not accept dioxin-listed wastes as defined in Subpart EEE, section 1204(c)(2).

Table 4-10. Destruction and Removal Efficiencies

Condition II	**1**	**2**	**3**	**Average**
Semi-Volatile Organic Constituent				
1, 2, 4-Trichlorobenzene	99.9985%	99.9987%	99.9987%	99.9987%
Volatile Organic Constituent				
Perchloroethylene	99.9993%	99.9993%	99.9994%	99.9993%

For both POHCs and in all runs, the emission rate was not detectable for TCB or Perc. DREs were calculated using the non-detect value as the emission. Non-detect values for inputs were assumed to be zero for the calculation.

Due to the physical properties of TCB, the process feedstream analysis for TCB were analyzed using analytical method SW-846 8270C. For non-detectable values, zero was assumed as the concentration in the average.

4.4 Operating Parameter Limits

The following subsections describe the OPLs set during the CPT, how they were derived, and the actual calculated values that is included as the NOC limit for future operations.

4.4.1 Maximum Air Pollution Control Device Inlet Temperature

As defined in 40 CFR Part 63, sections 63.1209(k)(1) and (n)(1), a maximum APCD inlet temperature is to be set during the CPT on an hourly rolling average (HRA) basis as the average of the applicable test run averages. For this OPL, both D/F and SVM/LVM parameters require the establishment of a limit. These parameters are set, however, in different, conflicting operating conditions. D/F emission testing was completed in Condition III, while metals were tested in Condition I only. Therefore, the lower of the two modes was used to set the OPL for the kiln operation under the HWC MACT requirements. Table 4-11 presents the test run averages and the average of each condition. As seen from the data, Condition I produced the lowest temperature average, and this value will become the OPL for the kiln system.

As detailed in Section 2.4 of this report, Essroc has chosen to comply with an alternative operating scenario when hazardous waste is no longer in the kiln system (after the hazardous waste residence time has expired). Essroc may either comply with the limit on the same averaging period as defined in the HWC MACT rule (i.e., HRA) or revert to the averaging period under Subpart LLL (i.e., three-hour rolling average or 3-HRA). In either case, the compliance averaging time will be documented in the operating record at the time of the switch. As for the limit, both Subpart LLL and Subpart EEE base the limit on the average of the test run average. Therefore, the limit shown in the table below is the same for both cases.

Table 4-11. Maximum APCD Inlet Temperature

Condition I	**1**	**2**	**3**	**Average**
Test Run Average	396 °F	399 °F	396 °F	397 °F
Condition III	**4**	**5**	**6**	**Average**
Test Run Average	398 °F	399 °F	398 °F	398 °F
Subpart EEE OPL (HRA)				398 °F
Alternate Operating Scenario 1 OPL (1HRA)				397 °F
Alternate Operating Scenario 2 OPL (3HRA)				397 °F

4.4.2 Minimum Combustion Chamber Temperature

As defined in 40 CFR Part 63, section 63.1209(j)(1), a minimum combustion chamber temperature is to be set during the CPT on an HRA basis as the average of the applicable test run averages. For this OPL, both DRE and D/F parameters require the establishment of a limit. Per Essroc's conversation with IDEM, D/F emissions are driven primarily by APCD inlet temperature and therefore not a function of the combustion chamber temperature. Therefore, the minimum combustion chamber temperature is set during the Condition II testing for DRE. Because measuring the actual combustion zone exit temperature in the rotary cement kiln is not practical, a surrogate temperature location is used. This location is the entrance to the chain zone section of the rotary kiln, which is in the upper end of the kiln after both the midkiln and burning zone fuel firing locations. Therefore, this location will serve as the surrogate for both the CWDF and LWDF fuel combustion zones within the kiln.

Table 4-12. Minimum Combustion Temperature

Condition II	1	2	3	Average
Test Run Average	1,627 °F	1,583 °F	1,580 °F	1,597 °F
Subpart EEE OPL (HRA)				1,597 °F

4.4.3 Maximum Combustion Chamber Pressure

As defined in 40 CFR Part 63, sections 63.1209(p), a maximum combustion chamber pressure is to be determined in order to prevent fugitive emissions leaks from the kiln system. This parameter is set by maintaining a negative pressure differential across both the CWDF midkiln and LWDF burning zone fuel combustion zones. A pressure sensor is located in the burning zone firing hood and in the ductwork just before the APCD. The pressure differential between these units ensures that a negative pressure is maintained across the entire rotary kiln. The limit is expressed on an instantaneous basis (one (1) second) and is set in the system as 0.05 inch of water column (in. W.C.)

4.4.4 Maximum Production Rate

As defined in 40 CFR Part 63, sections 63.1209(j)(2), (k)(3), (m)(2), (n)(5), and (o)(2), a maximum airflow or production rate is to be set during the CPT on an HRA basis as the average of the applicable test run maximum HRAs. For this OPL, DRE, D/F, PM, SVM/LVM, and HCl/Cl_2 parameters require the establishment of a limit. These parameters are set, however, in different conflicting operating conditions. As detailed in Table 4-2 of the CPT Plan, the maximum production rate was to be set in Condition I. Additionally, the monitoring of clinker production rate or airflow is not practical at this facility; therefore, kiln feed flow rate is used as a surrogate for production rate. The flow meter for the kiln feed or slurry measures the rate on a volumetric basis and converts this value to a dry ton per hour feed rate. This dry ton per hour rate is to become the OPL for this parameter. Table 4-13 provides the HRAs for each applicable run and the average of these values, which is the OPL for this parameter.

The maximum HRA for each run was taken from a data set that started at the beginning of each test run since the kiln system was at equilibrium or steady state prior to the initiation of that particular run. Therefore, the HRA at the beginning of the test run was an accumulation of value test data taken at steady-state conditions.

Table 4-13. Maximum Production Rate

Condition I	1	2	3	Average
Test Run Average (dry tons of kiln feed per hour)	86.7 tph	85.1 tph	86.2 tph	86.0 tph
Subpart EEE OPL (HRA)				86 tph

For the CPT, slurry moistures were obtained from the samples taken during each test run. These values allowed the dry kiln feed rate to be calculated from the measured wet kiln feed rate. Future operations will use a monthly average from the previous month's operations as the conversion factor for the current month's operation. Slurry samples are taken at least daily when the raw mill is in operation. These values are then entered into a PLC logic program for the calculation of the monthly average.

4.4.5 <u>Maximum Pumpable Hazardous Waste-Derived Fuel Flow Rate</u>

As defined in 40 CFR Part 63, sections 63.1209(j)(3) and (k)(4), a maximum pumpable HWDF flow rate is to be set during the CPT on an HRA basis as the average of the applicable test run maximum HRAs. For this OPL, DRE and D/F parameters require the establishment of a limit. These parameters are set, however, in a conflicting operating condition. As detailed in Table 4-2 of the CPT Plan, the maximum pumpable HWDF flow rate was to be set in Condition I. For this parameter, only the LWDF is considered a pumpable WDF. Table 4-14 provides the HRAs for each applicable run and the average of these values, which is the OPL for this parameter. To obtain these values, the spiking material flow rate was added to the actual LWDF input rate to obtain the pumpable WDF input rate values.

As was the case in Section 4.4.4 of this report, the maximum HRA for each run was taken from a data set that started at the beginning of each test run since the kiln system was at equilibrium or steady state prior to the initiation of that particular run. Therefore, the HRA at the beginning of the test run was an

Table 4-14. Maximum LWDF Flow Rate

Condition I	1	2	3	Average
Test Run Average (LWDF lbs/min)	444.9 lbs/min	454.2 lbs/min	454.3 lbs/min	451.1 lbs/min
Test Run Average (LWDF tons/hour)	13.3 tph	13.6 tph	13.6 tph	13.5 tph
Subpart EEE OPL (HRA)				451 lbs/min (13.5 tph)

The Essroc kiln control system displays the value for this parameter in pounds per minute, which is converted to tons per hour by the computer. Compliance is maintained in the tons per hour format.

4.4.6 Maximum Total Hazardous Waste-Derived Fuel Flow Rate

As defined in 40 CFR Part 63, sections 63.1209(j)(3) and (k)(4), a maximum total HWDF flow rate is to be set during the CPT on an HRA basis as the average of the applicable test run maximum HRAs. For this OPL, DRE and D/F parameters require the establishment of a limit. These parameters are set, however, in a conflicting operating condition. As detailed in Table 4-2 of the CPT Plan, the maximum total HWDF flow rate was to be set in Condition I. For this parameter, both the CWDF and LWDF are considered for this OPL. In addition, the spiking compounds injected with the CWDF and LWDF were also added to the value. Table 4-15 provides the HRAs for each applicable run and the average of these values, which is the OPL for this parameter.

As was the case in Sections 4.4.4 and 4.4.5 of this report, the maximum HRA for each run was taken from a data set that started at the beginning of each test run since the kiln system was at equilibrium or steady-state at least one hour prior to the initiation of that particular run. Therefore, the HRA at the beginning of the test run was an accumulation of value test data taken at steady-state conditions.

Table 4-15. Maximum Total WDF Flow Rate

Condition I	1	2	3	Average
Test Run Average (LWDF and CWDF rate, lbs/min)	477.0 lbs/min	488.3 lbs/min	486.8 lbs/min	484.0 lbs/min
Test Run Average (LWDF and CWDF rate, tons/hour)	14.3 tph	14.6 tph	14.6 tph	14.5 tph
Subpart EEE OPL (HRA)				484 lbs/min (14.5 tph)

4.4.7 Maximum Total Semi-Volatile Metal Feed Rate

As defined in 40 CFR Part 63, section 1220(a)(3), a maximum total SVM feed rate is to be set on a 12-hour rolling average (12-HRA) basis as the average of the applicable test run averages extrapolated to the regulatory level of 330 ug/dscm.

The SRE value for the SVM constituent (in this case, lead) is used to extrapolate the feed rate limit used in the FAP. Specifically, the SVM regulatory limit, air flow rate during the CPT, and the SREs are used to calculate the feed rate limit using the following equation.

$$\text{SVM Feed Rate} = \frac{R_1 \times A}{(1 - \text{SRE})}$$

where:

R_1 is the SVM regulatory limit of 330 ug/dscm;
A is the average airflow rate measured by the multi-metals emission sampling train from Condition I of the CPT; and,
SRE is the average system removal efficiency of lead during the three Condition I test runs from Section 4.3.7.

The actual value is

$$\text{SVM Feed Rate (lb/hr)} = \frac{(330\text{ ug/dscm})(2346\text{ dscm/min})(60\text{ min/hr})}{(1\text{x}10^6\text{ ug/g})(453.59\text{ g/lb})(1\text{-}0.9999)} = 1013\text{ lb/hr}$$

In order to ensure continuous compliance with the standard, an operating limit of 75 percent of this calculated value is imposed. Therefore, the SVM feed rate limit was calculated to be 760 lb/hr total input and will be incorporated into the FAP, which is included in Attachment K of this report. Additionally, the Btu based emission limit was also extrapolated and a 75 percent limit imposed as well. This calculation is based on the following equation:

$$\text{SVM Limit} = \frac{R_2}{(1 - \text{SRE})}$$

where:

R_2 is the SVM regulatory limit of $7\text{x}10^{-4}$ MMbtu; and,
SRE is the average system removal efficiency of lead during the three Condition I test runs from Section 4.3.7.

The actual value is

$$\text{SVM Limit} = \frac{7.6 \text{ x } 10^{-4}}{(1\text{-}0.9999)} = 7.52\text{ lb/MMbtu}$$

At 75%, the SVM limit is 5.64 lb/MMbtu.

Continuously monitoring and recording the feed rate of the appropriate feed streams and knowing the concentration of the regulated parameters in each feed stream is typically used to demonstrate compliance with a feed rate limit under the HWC MACT regulation. This information is used to demonstrate that the feed rate of each regulated constituent is in compliance with the allowable constituent feed rate limits.

One method for demonstrating compliance with constituent feed rate limits is to analyze each batch of material prior to its being fed to the cement kilns (e.g., CWDF and LWDF, etc.). The measured concentration of each regulated parameter is then used to calculate the total feed rate of each metal and chlorine fed to the cement kiln.

Another method for demonstrating compliance with feed rate limits is to use a statistical approach for determining the concentration of each constituent in the feed streams (e.g., kiln feed, solid fossil fuels, etc.). The statistically derived value is then used to calculate the total feed rate of each metal and chlorine fed to the cement kiln.

Section 8 of the FAP presents the statistical approach that does not require the sampling and analysis of each batch of material prior to being fed to the cement kilns, and can be used to demonstrate compliance with constituent feed rate limits. This statistical approach also establishes a sampling and analysis frequency based on the consistency of the feed stream. The statistical approach presented is based on the EPA's "Waste Analysis Guidance for Facilities That Burn Hazardous Waste" (EPA Guidance) and uses Upper Tolerance Limit (UTL) statistics.

4.4.8 Maximum Total Low Volatility Metal Feed Rate

As defined in 40 CFR Part 63, section 1220(a)(4), a maximum total LVM feed rate is to be set on a 12-HRA basis as the average of the applicable test run averages extrapolated to the regulatory level of 56 ug/dscm.

Similar to the SVM limit, the LVM feed rate limit is calculated using the LVM regulatory limit, air flow rate during the CPT, and the SRE with the following equation.

$$\text{LVM Feed Rate} = \frac{R_l \text{ x } A}{(1 - \text{SRE})}$$

where:

R_l is the LVM regulatory limit of 56 ug/dscm;

A is the average airflow rate measured by the multi-metals emission sampling train from Condition I of the CPT; and,

SRE is the average system removal efficiency of chromium during the three Condition I test runs from Section 4.3.7.

The actual value is

$$\text{LVM Feed Rate (lb/hr)} = \frac{(330 \text{ ug/dscm})(2346 \text{ dscm/min})(60 \text{ min/hr})}{(1\text{x}10^6 \text{ ug/g})(453.59 \text{ g/lb})(1\text{-}0.9996)} = 427 \text{ lb/hr}$$

In order to ensure continuous compliance with the standard, an operating limit of 75 percent of this calculated value is imposed. Therefore, the LVM feed rate limit was calculated to be 320 lb/hr total input and will be incorporated into the FAP, which is included in Attachment K of this report. Additionally, the Btu based emission limit was also extrapolated and a 75 percent limit imposed as well. This calculation is based on the following equation:

$$\text{LVM Limit} = \frac{R_2}{(1 - \text{SRE})}$$

where:

R_2 is the LVM regulatory limit of 2.1×10^{-5} MMbtu; and,
SRE is the average system removal efficiency of lead during the three Condition I test runs from Section 4.3.7.

The actual value is

$$\text{LVM Limit} = \frac{7.6 \times 10^{-4}}{(1-0.9996)} = 5.16 \times 10^{-1} \text{ lb/MMbtu}$$

At 75%, the LVM limit is 3.87×10^{-1} lb/MMbtu.

4.4.9 Maximum Pumpable Low Volatility Metal Feed Rate

As defined in 40 CFR Part 63, section 1209(n)(2)(vi), a maximum pumpable LVM feed rate is to be set on a 12HRA basis as the average of the applicable test run averages extrapolated to the regulatory level of 56 ug/dscm.

To obtain the actual pumpable LVM input limit used in this statistical analysis, the feed rate is extrapolated using the SREs summarized in Section 4.3.7. Since this extrapolation method uses the same methodology as the total LVM value, the LVM values derived in Section 4.4.8 of this report form the basis for the limit. The pumpable versus non-pumpable values are based on the percentage of WDF from Condition I fed through the LWDF lance versus CWDF injected mid-kiln. That percentage is 94.7% pumpable. Therefore, the pumpable LVM limit after the 75% adjustment is 303 lb/hr. Attachment D provides these calculations.

4.4.10 Maximum Total Mercury Feed Rate

As defined in 40 CFR Part 63, section 1209(l)(1)(iii)(C), Essroc has chosen to comply with the mercury (Hg) standard through the use of maximum theoretical emission concentration (MTEC). The limitation for existing kilns under the mercury MTEC approach will be 120 ug/dscm.

To determine the allowable feed rate of mercury, certain CPT data will be used along with the MTEC limit to derive a feed rate. The following equation is used to calculate the MTEC mercury feed rate for use in the FAP.

$$\text{Hg Feed Rate} = R \times A$$

where:

R is the MTEC regulatory limit of 120 ug/dscm; and
A is the average airflow rate measured by the multi-metals emission sampling train from Condition I of the CPT.

The actual value is

$$\text{Hg Feed Rate (lb/hr)} = \frac{(120\ \text{ug/dscm})(2{,}346\ \text{dscm/min})(60\ \text{min/hr})}{(1\text{x}10^6\ \text{ug/g})(453.59\ \text{g/lb})}$$

The mercury feed rate limit is calculated to be 0.037 lb/hr. This value will be used in the metals and chlorine management program included in the FAP, which is included in Attachment K of this report.

4.4.11 Maximum Total Chlorine/Chloride Feed Rate

As defined in 40 CFR Part 63, sections 63.1209(n)(4) and (o)(1), a maximum chlorine/chloride feed rate is to be set during the CPT on a 12-HRA basis as the average of the applicable test run averages. For this OPL, both SVM/LVM and HCl/Cl_2 parameters require the establishment of a limit. Since both of these parameters were set in Condition I, this OPL is set based on Condition I operations. Table 4-16 summarizes the chlorine/chloride input rates during each test run in Condition I and the average of these test run averages.

Table 4-16. Maximum Total Chlorine/Chloride Feed Rate

Condition I	1	2	3	Average
Test Run (lb/hr)	lb/hr	lb/hr	lb/hr	lb/hr
	364.9	370.9	415.1	383.6
Subpart EEE OPL (HRA)				384

4.4.12 Slurry Moisture and Specific Gravity Correction Factor

The slurry moisture is used to convert the volumetric flow rate monitoring output for the kiln feed (slurry) to a dry basis. In addition, the specific gravity of the slurry is used to convert the volumetric readings to a mass value. Both of these values were obtained for each test run to properly determine the dry kiln feed rate for the purpose of calculating an OPL. Table 4-17 summarizes the values obtained for Conditions I and II of the CPT.

Table 4-17. Slurry Moisture and Specific Gravity Values

Condition	Run	Slurry Moisture (%)	Specific Gravity (lb/gal)
I	1	35.2	15.72
	2	34.7	15.60
	3	35.0	15.92
	Average	35.0	15.75
II	1	42.0	13.70
	2	34.5	13.09
	3	37.6	13.99
	Average	38.0	13.59

Essroc takes routine slurry samples to evaluate the performance of the raw milling operation and to adjust the process to produce slurry of a predetermined quality and specification. The analysis of these samples includes specific gravity and moisture content. On a monthly basis, an average value for these two parameters will be calculated and used during the upcoming month's operations.

5.0 CONTINUOUS MONITORING SYSTEM PERFORMANCE EVALUATION

This section provides information on the initial CMS performance evaluations for the equipment used to monitor the applicable OPLs and emission limits of Subpart EEE.

5.1 Introduction

Subpart EEE requires Essroc to conduct performance evaluations of components of CMSs in accordance with 40 CFR Part 63, subpart A, sections 63.8(d) and (e). This section summarizes the procedures used for the initial CMS performance evaluations of affected equipment. Table 5-1 presents an instrumentation PS and calibration summary for affected CMS equipment. Attachment C contains the latest performance evaluation documentation for each of the affected CMSs. In addition to conducting the initial performance evaluations, Essroc also calibrated relevant CMSs prior to the CPT in conformance with good engineering practice for emissions testing programs and applicable PSs. Relevant Subpart EEE CMS performance evaluation activities are summarized in this section while pretest CMS calibration documentation is also provided in Attachment C.

Table 5-1. CMS Instrumentation Performance Specification and Calibration Summaries

Process Parameter	Units	Performance Specification	OMP Calibration Summary
Opacity	Percent	40 CFR Part 60, Appendix B, PS-1	Quarterly: PS-1 Daily: Zero and Span
LWDF Feed Rate	pounds per minute	Manufacturer's Specification and Essroc SOP	Annually: measured flow
CWDF Feed Rate	pounds per minute	Manufacturer's Specification and Essroc SOP	Annually: known weight
Fossil Fuel Feed Rate	tons per hour	Manufacturer's Specification and Essroc SOP	Annually: known weight
Kiln Feed (Slurry) Rate	tons per hour	Manufacturer's Specification and Essroc SOP	Annually: measured flow
APCD Inlet Temperatures	°Fahrenheit	Manufacturer's Specification and Essroc SOP	Annually: conductivity
Chain Zone Temperature (Combustion Chamber Temperature)	°Fahrenheit	Manufacturer's Specification and Essroc SOP	Annually: conductivity
THC Monitor	ppm corrected to 7% O_2	40 CFR Part 60, Appendix B, PS-8A and Essroc SOP	Quarterly: PS-8A Daily: zero and span
O_2 Monitor	percent O_2	40 CFR Part 60, Appendix B, 4B and Essroc SOP	Quarterly: PS-4B Daily: zero and span

Process Parameter	Units	Performance Specification	OMP Calibration Summary
Differential Pressures	inches water column	Manufacturer's Specification and Essroc SOP	Quarterly: electronic
Bag Leak Detector	triboelectricity (4-20 mA)	Manufacturer's Specification and Essroc SOP	Annually: zero

5.2 Hydrocarbon Continuous Emission Monitoring System

The installation location, initial evaluation, and periodic calibrations for the Rosemount Analytical Model 402/402RS hydrocarbon monitors were performed in accordance with PS-8A as detailed in Essroc's SOPs. The initial performance evaluations for both kilns were completed in December 2003 and the latest evaluation is included in Attachment C. The pre-test calibrations were completed prior to the CPT and are included in Attachment C. Both the initial performance evaluation and the pretest calibrations show that the THC monitor is operating in compliance with PS-8A and is providing accurate data.

5.3 Oxygen Continuous Emission Monitoring System

The installation location, initial evaluation, and periodic calibrations for the Yokogawa model ZA8C O_2 monitor were performed in accordance with Essroc's SOPs, which are based on PS-4B. The initial performance evaluations for both kilns were conducted in December 2003 and the latest evaluation is included in Attachment C. The pre-test calibrations were completed prior to the CPT and are included in Attachment C. Both the initial performance evaluation and the pretest calibrations show that the O_2 monitor is operating in compliance with PS-4B and is providing accurate data.

5.4 Continuous Opacity Monitoring System

The installation location, initial evaluation, and periodic calibrations for the United Sciences Inc. model 560 stack opacity monitoring system were performed in accordance with PS-1 as found in Essroc's SOPs. The initial performance evaluation was completed in March 1999 and the latest evaluation is included in Attachment C. The pre-test calibrations were completed prior to the CPT and are included in Attachment C. Both the initial performance evaluation and the pretest calibrations show that the unit is operating in compliance with PS-1 and is providing accurate data.

5.5 Air Pollution Control Device Inlet Temperature Thermocouple

The installation location, initial evaluation, and periodic calibrations for the W.H. Cook model 0068T21N00H240T22x8Q4 Type IPRT temperature thermocouple at the APCD inlet were performed in accordance with Essroc's SOPs, which are in compliance with 40 CFR 63.1209(b). The thermocouple system has been factory certified against National Institute of Standards and Technology (NIST) traceable standards. The initial performance evaluations were completed in December 2003 and the latest thermocouple was placed into service on September 23, 2009. Evaluations are included in Attachment C. Factory certifications for the thermocouple as purchased are also included in Attachment C. The initial performance evaluation was within a few months of the CPT; therefore, no pre-test calibrations were necessary. The initial performance evaluation shows that the thermocouple is providing accurate data.

5.6 Combustion Chamber Exit Gas Temperature Thermocouple (Chain Zone)

The installation location, initial evaluation, and periodic calibrations for the Richards model 8K2-24 Type K temperature thermocouple at the APCD inlet were performed in accordance with Essroc's SOPs, which are in compliance with 40 CFR 63.1209(b). The thermocouple system has been factory certified against NIST-traceable standards. The initial performance evaluations were completed in December 2003 and the latest thermocouple was calibrated September 23, 2009. Evaluations are included in Attachment C. Factory certifications for the thermocouples as purchased are also included in Attachment C. The initial performance evaluation was within a few months of the CPT; therefore, no pre-test calibrations were necessary. The initial performance evaluation shows that the thermocouple system is providing accurate data.

5.7 Combustion Zone Fugitive Emissions Pressure Transmitter

Two pressure transmitters are used to calculate the differential pressure across the rotary kiln system. One unit is located in the kiln hood at the burning zone, and the second is located in the ductwork between the kiln and APCD. The locations use a Foxboro model 14B and a Endress and Hauser Deltabar S, respectively, to monitor the system pressure.

The installation location, initial evaluation, and periodic calibrations of the pressure transmitters were performed in accordance with Essroc's SOP, which is based on manufacturer's information and the requirements of 40 CFR 63.1209(b). The initial performance evaluations were completed in December 2003. Pre-test calibrations were completed before the CPT and are included in Attachment C. The initial performance evaluation shows that the units are providing accurate data.

5.8 Kiln Feed Flow Rate Monitor

The installation location, initial evaluation, and periodic calibrations for the Foxboro model 9652-C magnetic flowmeter were performed in accordance with Essroc's SOP, which is based on factory specifications from the manufacturer and the requirements of 40 CFR 63.1209(b). The flowmeter system has been factory certified against NIST-traceable standards. The initial performance evaluations were completed in December 2003. Pre-test calibrations were performed just before the CPT and are included in Attachment C. The initial performance evaluation shows that the unit is providing accurate data.

5.9 Fossil Fuels Flow Rate Monitor

The installation location, initial evaluation and periodic calibrations for the Merrick Auto-Weigh Micro VI conveyor belt feeder were performed in accordance with Essroc's SOP, which is based on Merricks's Operational/Integrator Manual recommendations and the requirements of 40 CFR 63.1209(b). The initial performance evaluations were completed in December 2003. The pre-test calibrations were completed before the CPT and are included in Attachment C. The initial performance evaluation shows that the unit is providing accurate data.

5.10 Liquid Hazardous Waste-Derived Fuel Flow Rate Monitor

The installation location, initial evaluation, and periodic calibrations for the Micro-Motion model RFT9712 coriolis mass flow meter were performed in accordance with Essroc's SOP, which is based on factory specifications from the manufacturer and the requirements of 40 CFR 63.1209(b). The initial performance evaluations were completed in December 2003 and the latest evaluation is included in Attachment C.

5.11 Containerized Hazardous Waste-Derived Fuel Flow Rate Monitor

The installation location, initial evaluation and periodic calibrations for the Fairbanks-Morse model 2197 auto-weigh scale were performed in accordance with Essroc's SOP, which is based on Merricks's Operational/Integrator Manual recommendations and the requirements of 40 CFR 63.1209(b). The initial performance evaluations were completed in December 2003 and the latest evaluation is included in Attachment C.

5.12 Bag Leak Detector System (BLDS)

The installation location, initial evaluation and periodic calibrations for the Auburn Systems, LLC, TRIBOGUARD II, Model 4002 BLDS detection probes were performed in accordance with Essroc's SOP, which is based on factory specifications from the manufacturer and the requirements of 40 CFR 63.1206(c)(8). The initial performance evaluation was completed in September 2008 and is included in Attachment C.

6.0 AUTOMATIC WASTE FEED CUTOFFS

The following subsections provide data on the HWC MACT-required automatic waste feed cutoffs (AWFCOs), their operability checks, listing of instantaneous and ramp-down parameters, and a listing of the applicable AWFCO levels.

6.1 Introduction

One of the primary purposes of the CPT is to establish process set point limits where AWFCOs are to be established for subsequent kiln operations. Subpart EEE, section 1206(c) requires Essroc to operate the kiln system with a functioning system that automatically cuts off the hazardous waste feed when OPLs are exceeded, CMS (but not CEMs) span values are met or exceeded, upon malfunction of a CMS monitoring an OPL or an emission level, or when any component of the AWFCO system fails. The purpose of the AWFCO system is to monitor the kiln system for upset conditions or to detect operating parameters that exceed established limits.

6.2 Listing of Automatic Waste Feed Cutoffs

There are two different types of AWFCOs allowed under the HWC NESHAP standard – instantaneous and "ramp-down". The instantaneous AWFCOs result in the waste feed being immediately cut off from the kiln by closing appropriate valves in the waste feed system. The "ramp-down" AWFCO allows the waste feed to the kiln to be cut off within one minute of triggering an exceedance. Utilizing a ramp-down helps the operator maintain control of the kiln operation.

Table 6-1 lists the instantaneous and ramp-down AFWCO parameters. For parameters listed in the ramp-down section, instantaneous AWFCO settings may be used as a conservative substitute.

6.3 Automatic Waste Feed Cutoff Operability

Table 6-1 identifies the operating parameters that will cause the WDF feeds to be shut off automatically. In addition, when continuous monitoring systems go out of control, WDF firing will automatically cease. The AWFCO set points listed in Table 6-1 are based on the CPT results and/or applicable Subpart EEE requirements.

Except for the combustion chamber differential pressure and opacity, the process parameters listed in the table are evaluated at least every 15 seconds. An average value is then computed for every minute; and the one-minute averages are used to compute HRAs as the arithmetic mean created from the most recent one-minute average values. Therefore, a 1-HRA will be the most recent 60 one-minute values. As long as all the waste feed cutoff parameters have an acceptable value compared to their set points, a permissive signal will be transmitted to a PLC. The PLC will control the LWDF feed valves and the SWDF feed system electrical circuits. Except for kiln differential pressure and opacity, if the HRA value of any of the listed parameters exceeds the set point, the permissive signal will be lost, and WDF feed will be effectively cut off.

The kiln differential pressure is evaluated every second and the maximum value in each minute is recorded as the one-minute data point. If any one-second kiln pressure value exceeds its corresponding set point, the permissive signal will be lost, and the WDF feed will be cut off.

Opacity is evaluated at least every 10 seconds and a 6-minute block average is computed. If a 6-minute block average opacity value exceeds the set point, the permissive signal is lost and WDF feed is cut off. This, however, is a current Title V limitation and not required under HWC MACT since a BLDS is installed on kiln 1's baghouse.

After a waste fuel cutoff, the WDF feed systems will remain inoperative until the values of all waste feed parameters are returned to within established operating ranges. Pre-alarms will alert the operator to potential problems in order to allow either corrective measures to be taken or for a staged cutoff of the WDF.

If there is a CWDF container in the injection system during a waste feed cutoff, it will be burned. The remaining CWDF containers on the conveyor belt will not enter the feed tube to the kiln system. When the LWDF is shut off, excess LWDF will be circulated to the LWDF storage tank. As described in the SSMP, if WDF feed is stopped, fossil fuel will be used to replace the thermal energy supplied by the WDF. This is done to maintain the kiln system operation and allows for the destruction of constituents of WDF remaining in the system. The process and emission monitors will continue to function throughout the WDF residence time. CWDF and LWDF will not be added to the kiln system during a system shutdown or until all applicable system operating parameters are within established values.

In accordance with the OMP, the AWFCO system operability will be verified monthly by one of two methods. The first is by establishing or causing a trip of one of the WDF cutoff set point parameters and observing that the trigger resulted in cessation of WDF flow. A different cutoff parameter is selected each week on a rotating basis. The second method involves verifying that an AWFCO has shut the WDF value systems each week. The chosen AWFCO parameters can then be checked for proper operation by ensuring the AWFCO signal reaches the automated WDF valves. This method limits kiln upsets by testing the signal without actually shutting off WDF flow.

The integrity of the control loops will be continuously verified through the establishment of "fail safe" circuits. For example, if a thermocouple (or its associated field wiring) fails, the control circuit is configured to cause the indicated temperature to go to minimum or maximum scale, as appropriate, thereby tripping an alarm and causing an AWFCO. These alarms and waste-feed cutoffs will notify the operator to check the affected process control circuits for integrity and/or proper operation. A permissive signal from the PLC will be required to allow WDF to be fed to the kiln system. The valves on the LWDF feed lines are "normally closed", and the run circuits for the CWDF feed system are "normally open"; therefore, a power failure or the loss of the permissive signal will cause the WDF feed systems to stop. In addition, each of the AWFCO controllers is inspected daily for proper function and operational readiness.

Table 6-1. Summary of AWFCO Operating Parameter Limits

Emission Limit/OPL	OPL from CPT	AWFCO Type
Min. Combustion Chamber Exit Temperature (°F)	1,597	Instantaneous
Max. Slurry Feed Rate (dry, tph)	86	Instantaneous
Max. CWDF Feed Rate (lbs/min)	33	Instantaneous
Max. LWDF Feed Rate (lbs/min)	451	Instantaneous
Max. APCD Inlet Temperature (°F)	397	Ramp-Down
Max. Opacity (%)[1]	20	Ramp-Down
Max. THC (ppm)	20	Ramp-Down
Max. Rotary Kiln Differential Pressure (in. H_2O)	0.05	Instantaneous – 1 second
Max. Total Hg Feed Rate (lbs/hr)	0.037	Instantaneous
Max. Total SVM Feed Rate (lbs/hr)	760	Instantaneous
Max. Total LVM Feed Rate (lbs/hr)	320	Instantaneous
Max. Pumpable LVM Feed Rate (lbs/hr)	303	Instantaneous
Max. Total Chlorine/Chloride Feed Rate[2] (lbs/hr)	384	Instantaneous

[1]Not applicable under HWC MACT due to the installation of the BLDS
[2]As determined through the FAP.

7.0 QUALITY ASSURANCE AND QUALITY CONTROL DOCUMENTATION

Quality assurance/quality control (QA/QC) review of all aspects of the CPT program is instrumental in ensuring that the CPT was conducted in a manner to produce quality data. The review of the background data, sampling procedures, calculations, and target operations are included in the following sections.

7.1 Introduction

The CPT program involved the use of numerous contractors in order to ensure that the CPT was conducted in accordance with the applicable regulations and the CPT Plan. Attachment E includes a listing of the companies and personnel that participated in the CPT program and their qualifications.

The following summarizes the QA/QC review of the conduct of the CPT as it relates to the requirements set forth in the CPT Plan, QAPP, and the applicable regulatory references.

7.2 Contractor and Personnel Responsibilities

The following section describes the responsibilities of the various contractors and their personnel in the completion of the CPT and its reports. Any variations from the revised QAPP are noted below.

7.2.1 Essroc Cement Corp.

Essroc personnel were responsible for the following tasks during the CPT:

- Operation of the cement kiln in the performance of the objectives outlined in the CPT Plan and in accordance with the testing provisions of Subpart EEE;
- Collection and data reduction of all kiln operational process data;
- Collection of all CMS performance evaluation documentation;
- Completion and collection of all pre-test CMS equipment calibrations;
- Collection of all input and output process samples obtained in accordance with the CPT Plan; and
- Retention of the retain samples taken from the splits of the input and output composite samples.

One Essroc position was responsible for the oversight of these activities - the Essroc Project Manager (Essroc PM). The Essroc PM for the CPT was Corey Conn. The Essroc Sampling Field Coordinator (Essroc SFC) worked directly with the Essroc PM to ensure that all samples were taken in accordance with the CPT Plan and QAPP. This position also acted as the sample custodian for all retained samples split from the composites. For the CPT, John Hook assumed the role of Essroc SFC. Operations personnel under the supervision of the Essroc

SFC completed all sampling, compositing, splitting, and preparation of process samples for transport.

Other Essroc personnel, including cement plant production personnel, working for the Essroc PM, were responsible for the collection of all documentation relating to process operational data and CMS reviews.

7.2.2 Avogadro Environmental Corporation

Avogadro personnel were responsible for the following CPT Condition I and III tasks:

- Collection of air emission samples for Conditions I and III;
- Packaging of collected CPT air emission samples and transport to the appropriate laboratories;
- Completion of certain laboratory tests for air emission samples, such as particulate matter;
- QA/QC reviews of all air emission field sampling data collection and calculations;
- QA/QC reviews of all laboratory data associated with the air emission samples taken during the CPT; and,
- Completion of a stack test report included as Attachment I of this report.

For Avogadro, three personnel are responsible for the overall completion of the above-mentioned tasks – the Avogadro PM, Avogadro Field Team Leader (FTL), and the Avogadro QA Manager.

The Avogadro PM (Laurie Snyder) was responsible for overall coordination of the project, calculations, and QA/QC activities. The Avogadro FTL (Jace Shively) was responsible for the completion of the stack emissions sampling and the management of the associated samples taken. Lastly, the Avogadro QA Manager (Thomas Mattei) was charged with the review of all field calculations, laboratory data reviews, and final stack test report QA/QC activities.

7.2.3 Weston Solutions, Inc.

Weston personnel were responsible for the following CPT Condition II tasks:

- Collection of air emission samples for Condition II;
- Packaging of collected CPT air emission samples and transport to the appropriate laboratories;
- Completion of certain laboratory tests for air emission samples, such as particulate matter;
- QA/QC reviews of all air emission field sampling data collection and calculations;

- QA/QC reviews of all laboratory data associated with the air emission samples taken during the CPT; and,
- Completion of a stack test report included as Attachment J of this report.

For Weston, three personnel are responsible for the overall completion of the above-mentioned tasks – the Weston PM, Weston Test Team Leader (TTL), and the Weston QA Manager.

The Weston PM (Gregory Sims) was responsible for overall coordination of the project, calculations and QA/QC activities. The Weston TTL (Jack Mills) was responsible for the completion of the stack emissions sampling and the management of the associated samples taken. Lastly, the Weston QA Manager (Melanie Wright) was charged with the review of all field calculations, laboratory data reviews, and final stack test report QA/QC activities.

7.2.4 Schreiber, Yonley & Associates

SYA personnel provided the independent QA/QC oversight of the entire project by completing the following tasks:

- Reviewing and observing kiln operations to ensure that all operations were completed per the CPT Plan and QAPP;
- Observe process and stack sampling operations to ensure that all activities were conducted in accordance with the CPT Plan, QAPP, and recognized procedures;
- Compositing and splitting all input and output process samples for transfer to the appropriate laboratories for analysis;
- Review stack emission sample recoveries and preparations to ensure compliance with standard methods and procedures;
- Obtain, review, and summarize all operational process data, stack emissions information, and laboratory data from the process samples;
- Calculate and/or review all emission, OPL, and supporting calculations; and,
- Complete the CPT report and NOC documentation detailing the results of the CPT.

SYA used three people to complete the required tasks for Conditions I and III – Brad Phillips, Tony Schiro, and Dan Carney. For Conditions I and III Brad Phillips completed the role of SYA PM, and Tony Schiro acted in the role of QA/QC Manager. SYA used two people to complete the required tasks for Condition II. Brad Phillips completed the role of SYA PM and Chuck Kellett acted in the role of QA/QC Manager. Copies of the field notes associated with the QA/QC oversight are included in Attachment M.

7.2.5 Environmental Laboratory Services

ELS provided two separate services for the CPT – on-site laboratory analysis and CPT process sample analysis at its commercial facility. Both of these services are summarized below, and the analytical results are included in Attachment G.

The on-site laboratory performed various sample analyses used in support of the CPT. One such set of analyses involved the CKD samples for use in determining the arrival of steady state. Other analyses involved the determination of chlorine and metals concentrations in the material feed streams to help approximate the feed rate inputs of these constituents prior to testing. Lastly, the on-site laboratory completed the volume/mass review of the prepackaged spiking containers for the lead oxide and TCB.

The process sample input and outputs from the CPT were transferred to the ELS commercial laboratory in Pennsylvania. This laboratory performed the physical parameter, metals, and chlorine laboratory tests on the applicable samples.

Several positions were responsible for the various operations performed by ELS. The on-site ELS laboratory manager (ELS LM) was responsible for the task associated with the on-site laboratory. For ELS's commercial operation, three positions of responsibility are noted. The ELS PM provided project oversight for both the on-site and commercial laboratory data generation and reporting, as well as the sample custodial duties. The QA/QC Manager for ELS was responsible for reviewing all laboratory data produced by ELS for proper laboratory data objectives.

7.2.6 Maxxam Analytics, Inc.

Maxxam provided analytical services for both the Avogadro and Weston CPT air emission stack samples. Clayton Johnson is the Maxxam PM for the CPT, and he ensured that all samples were properly received, analyzed, and reported. He also acted as the QA/QC manager and sample custodian for the samples for this project.

7.3 Data and Quality Control Objectives

The QA/QC section of this report summarizes the quality of the generated during the Essroc CPT with respect to the objectives in the CPT Plan and QAPP.

7.3.1 Precision

Precision is a measure of the degree to which two or more measurements are in agreement. Sampling precision is assessed through the use of the collection of field duplicates where applicable. Laboratory precision is assessed by calculating relative percent differences (RPD) or relative standard deviation (RSD). More detailed information for the calculation of precision and the acceptable limits are presented in the QAPP.

Particulate Matter – Stack Samples

Samples were collected and analyzed by Avogadro. Precision determinations consisted of consecutively weighing samples to a constant weight. The consecutive weighings were within the limits specified in EPA Reference Method 5. Full details of the analysis are found in Attachment I.

Hydrochloric Acid/Chlorine Gas – Stack Samples

Samples were collected by Avogadro and analyzed by Maxxam. Precision determinations consisted of the analysis of duplicate samples (RPD). Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment I.

Chlorine/Chloride – Process Samples

Samples were collected Essroc personnel and analyzed by ELS. Precision determinations consisted of the analysis of duplicate samples. Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

Metals – Stack Samples

Samples were collected by Avogadro and analyzed by Maxxam. Precision determinations consisted of the analysis of duplicate samples (RPD). Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment I.

Metals – Process Samples

Samples were collected Essroc personnel and analyzed by ELS. Precision determinations consisted of the analysis of duplicate samples. Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

Dioxins/Furans – Stack Samples

Samples were collected by Avogadro and analyzed by Maxxam. Precision determinations consisted of the analysis of batch control sample duplicates (RPD). Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment I.

Semi-Volatile Organic Compounds – Stack Samples

Samples were collected by Weston and analyzed by Maxxam. Precision determinations consisted of analyzing duplicate samples (RPD). Duplicate results were within the limits specified the QAPP. Full details of the analysis are found in Attachment J.

Semi-Volatile Organic Compounds – Process Samples

Samples were collected by Essroc personnel and analyzed by ELS. Precision determinations consisted of analyzing duplicate samples (RPD). Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

Volatile Organic Compounds – Stack Samples

Samples were collected by Weston and analyzed by Maxxam. Precision determinations consisted of analyzing duplicate samples (RPD). Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment J.

Volatile Organic Compounds – Process Samples

Samples were collected by Essroc personnel and analyzed by ELS. Precision determinations consisted of analyzing duplicate samples (RPD). Duplicate results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

7.3.2 Accuracy

Accuracy is the degree to which a measured value compares to an accepted reference value. Sampling accuracy is assessed through the use of field, trip, and reagent blanks and through the use of well-maintained and calibrated equipment. Laboratory accuracy is assessed though the use of matrix spikes (MSs) or laboratory control spikes (LCSs) and determination of percent recoveries. More detailed information for the calculation of accuracy and the acceptable limits is presented in the QAPP.

Particulate Matter – Stack Samples

Samples were collected and analyzed by Avogadro. Accuracy determinations consisted of using calibrated equipment against known standards. Equipment calibrations were within the limits specified in EPA Reference Method 5. Full details of the analysis are found in Attachment I.

Hydrochloric Acid/Chlorine Gas – Stack Samples

Samples were also collected and analyzed by Avogadro. The accuracy determination consisted of using calibrated equipment against known standards and the analysis of LCS, MSs, and blanks. All results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment I.

Chlorine/Chloride – Process Samples

Samples were collected Essroc personnel and analyzed by ELS. The accuracy determination consisted of using calibrated equipment against known standards and the analysis of MSs and blanks. All results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

Metals – Stack Samples

Samples were collected by Avogadro and analyzed by Maxxam. The accuracy determination consisted of the analysis of post-digestion spikes (PDS), internal standards, MSs, and blanks. Results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment I.

Metals – Process Samples

Samples were collected Essroc personnel and analyzed by ELS. The accuracy determination consisted of using calibrated equipment against known standards and the analysis of MSs and blanks. All results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

Dioxins/Furans – Stack Samples

Samples were collected by Avogadro and analyzed by Maxxam. Accuracy determinations consisted of analyzing pre-spike surrogates, internal standards, and batch control samples. Results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment I.

Semi-Volatile Organic Compounds – Stack Samples

Samples were collected by Weston and analyzed by Maxxam. Accuracy determinations consisted of analyzing internal standards, laboratory control samples, and surrogate recoveries. Results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment J.

Semi-Volatile Organic Compounds – Process Samples

Samples were collected Essroc personnel and analyzed by ELS. The accuracy determination consisted of using calibrated equipment against known standards and the analysis of MSs and blanks. All results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

Volatile Organic Compounds – Stack Samples

Samples were collected by Weston and analyzed by Maxxam. Accuracy determinations consisted of analyzing internal standards, laboratory control samples, and surrogate recoveries. Results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment J.

Volatile Organic Compounds – Process Samples

Samples were collected Essroc personnel and analyzed by ELS. The accuracy determination consisted of using calibrated equipment against known standards and the analysis of MSs and blanks. All results were within the limits specified in the QAPP. Full details of the analysis are found in Attachment G.

7.3.3 Completeness

Completeness is a measure of the amount of valid data/measurements collected compared to the total amount of measurements taken or expected.

A total of three test runs were conducted during Condition I and three test runs for Condition III. Process and emission sample analyses were completed for each run, which meets the Condition I testing objective. A total of three test runs were attempted during Condition II testing. Process and emission sampling and analyses were completed for each run, which meets the Condition II testing objective.

Overall, the completeness objective met the requirements as outlined in the QAPP.

7.3.4 Detection and Reporting Limits

Generally, there were no issues with analyte detection limits for the sample analyses. To be conservative, however, non-detect values for target compounds in process (inlet) steam samples were reported as zero concentration and non-detect values for emission (outlet) samples were reported as the method/instrument detection limit.

When sample dilutions were necessary to reduce analyte concentrations down to a specific instrument's range, dilution factors were kept at a minimum where possible to maximize detection limits.

7.4 Sample Handling, Traceability, and Holding Times

No problems were observed with sample handling, and there were no instances of broken or missing samples.

Some chain of custody errors were identified concerning the Condition I process samples. The Condition I Runs 1 and 2 clinker samples were incorrectly labeled as kiln feed. Samples described as Used Oil/Diesel on the chain of custody were labeled as Off-Spec Oil. Dates were omitted from the field blanks. The chain of custody does not indicate which metals to run. All of these discrepancies were identified and addressed.

Full analytical reports, containing chain of custody sheets, can be found in Attachments I and J. The analytical report for the process data is located in Attachment G.

7.5 Comprehensive Performance Test Plan and Quality Assurance Project Plan Deviations

The following is a description of any deviations from the procedures prescribed in the CPT plan and QAPP that occurred during the CPT program.

7.5.1 Process Sampling

These modifications mainly consisted of changing the size of the sample/composite container and the timing of compositing the samples. Each modification is discussed in the following sections.

7.5.1.1 Kiln Feed

A grab sample of kiln feed (slurry) was to be drawn at 1-hour intervals into a 500-mL glass sample jar. The 500-mL samples were to be composited into a 5-gallon bucket during the run.

The 500-ml samples were instead composited in a 2.5-L jar following the completion of each run. .

7.5.1.2 Containerized Hazardous Waste-Derived Fuel

A 500-mL glass sample jar was to be used to obtain a grab sample from the CWDF pails. Due to the consistency of the CWDF, a scoop was used to obtain a sample from each pail. The samples were then composited in a 5-gallon bucket and split into 2 2.5-L glass jars.

7.5.1.3 Solid Fossil Fuel

Samples of the solid fossil fuel were composited in 2.5-L glass jars rather than a 5-gallon bucket.

7.5.1.4 Clinker

Following grinding by the on-site cement lab, samples of clinker were composited in 2.5-L glass jars rather than a 5-gallon bucket.

7.5.1.5 Waste Cement Kiln Dust

A grab sample of waste CKD was to be drawn at 1-hour intervals and placed directly into a 5-gallon bucket for compositing.

The grab samples were placed into 1-gallon pails and then composited, following the completion of each run, in 2.5-L glass jars.

7.5.2 Process Monitoring

All process monitoring was completed by the equipment as specified in the CPT Plan and in accordance with the procedures contained in that Plan. No deviations from the anticipated process monitoring methods were observed or noted.

7.5.3 Stack Gas Sampling

The following modification was made to the stack sampling program in order to separate complete the D/F testing on the system.

7.5.3.1 Addition of Condition III

Essroc experienced difficulty raising the APCD temperature to the worst case level (i.e., 400°F) while dropping the combustion chamber temperature to its lowest pouint for worst case DRE emissions testing. Therefore, on 10/8/2009, Brad Phillips of SYA contacted Dave Harrison of IDEM to request splitting this run to allow for the elevation of the temperature to demonstrate worst case APCD inlet temperatures for D/F and the lowest combustion chamber temperature for DRE. It was agreed to allow the split of parameters and conditions. OPLs would be set in accordance with table 2-2 of this document.

7.5.4 Stack Gas Monitoring

All required stack gas monitoring required by the Subpart EEE regulations and completed by in-plant monitoring systems were completed as detailed in the CPT plan. These requirements included COMS (opacity) and CEMS (oxygen and total hydrocarbons). The COMS unit was used to monitor the visual emissions from the kiln operations rather than completing Method 9 readings.

7.5.5 Continuous Monitoring System Calibrations

Two sets of calibrations were completed for the CPT program, where applicable. These included the latest performance evaluations under Subpart EEE and the pre-test calibrations as required for stack emission tests. Both of these evaluations were completed and are included in Attachment C.

These evaluations and calibrations were completed in accordance with the applicable regulations, the facility's OMP, and manufacturers' recommendations. No deviations from these documents were observed in the review of the information.

7.5.6 Laboratory Analysis Deviations

Lab analysis for both stack and process samples were completed in accordance with specified methods as detailed in the CPT Plan. No deviations were noted.

7.6 Laboratory Analytical Review

After review of the sampling, analytical data and results, it was determined that all the data quality objectives from the CPT Plan and QAPP were met. No abnormalities exist that cause the data to be rejected or invalid; therefore, the data are considered valid.

7.6.1 Analytical Quality Checks

The various analyses performed on the stack gas samples and process samples included several analytical quality checks to determine the integrity of the data. These checks are individually presented in Section 7.3. The results of these checks are sufficient in demonstrating the data generated from the CPT are valid.

7.6.2 Laboratory Equipment Calibration and Maintenance Logs

Instruments used in the analysis of the collected samples have been adequately maintained and were calibrated prior to use. Full analytical reports containing instrument calibrations can be found in Attachments I and J. The analytical report for the process data is located in Attachment G.

7.7 Performance Evaluation Audits

No performance evaluation sample audits were completed for the emissions test program.

7.8 Stack Data Validation and Verification

The sampling equipment used during compliance testing met all specifications of the EPA testing methods for which they were used.

Field sampling equipment was calibrated prior to field sampling. Copies of the calibration sheets are included in Attachments I and J. Calibrations were performed as described in the EPA publications "Quality Assurance Handbook for Air Pollution Measurement Systems; Volume III – Stationary Source Specific Methods: (EPA-600/4-77-027b)" and EPA 40 CFR Part 60, Appendix A. Equipment calibrated included the sample metering system, nozzles, barometers, thermocouples, and Pitot tubes.

Exhaust gas samples were taken for: Method 0023A for D/F, Method 5 for PM, and Method 26A for Cl_2 and HCl, Method 0010 for semi-volatile organic compounds, Method 0030 for volatile organic compounds, and Method 29 for metals. Prior to sampling, all sample train glassware was cleaned as required by each respective EPA sampling method. All sample containers were received in sealed boxes from the vendor with certificates of QA compliance with EPA specifications.

Leak checks were performed before and after each sample of flue gas. Leak checks were 60-second tests with the leakage and pressure recorded.

8.0 AREA VERSES MAJOR SOURCE DETERMINATION

Subpart EEE requires the facility to provide an analysis demonstrating whether the affected source is a major source or an area source using the emissions data generated by the CPT. This evaluation is completed in accordance with 40 CFR Part 63, subpart A, section 63.9(h)(2)(i)(E). Based on the data, Essroc has elected to use only the HCl emission data to show that the facility is a major source.

The average HCl concentration from the stack emissions data was found to be 10.2 ppm, which correlates to an emission value of 4.4 pounds per hour of HCl emissions. If this number is taken as the annual average and extrapolated to an annual emission value, the facility has the potential to emit approximately 19.4 tons per year. Based on this level, the facility is classified as a major source. The following equation was used to calculate this value.

Annual emissions (tons/yr) = hourly emissions (4.4 lb/hr) x operating hours per year (8,760 hrs/year) / conversion from pounds to tons (2000 lbs/ton) = 19.4 tons/year

9.0 CALCULATION OF HAZARDOUS WASTE RESIDENCE TIME

Section 63.1206(b)(11) of Subpart EEE requires the residence time for hazardous waste in the system to be calculated in order to determine the minimum time that must pass from an AWFCO until waste ceases to be in the system.

Essroc has calculated the hazardous waste residence time to be 60 seconds by using the Air Flow Rate and System Volume Determination Method. This method of calculation involves determining the volume of each component of the kiln system and measuring the gas flow rate to calculate the residence time for a molecule of gas from the burning zone out the stack. Table 9-1 lists the physical assumptions needed for volume calculations, an airflow value, and the resulting gas residence time. The airflow is the lowest flow rate measured from all runs during the CPT. The lowest value was selected since that will produce the longest residence time for gases in the kiln system.

The hazardous waste residence time is calculated as:

$$t_{res} = \frac{V_{kiln}}{R_{air}}$$

where:

V_{kiln} = total volume of all identified kiln components (ft^3); and
R_{air} = measured air flow rate (acfm)

The hazardous waste residence time will be calculated continuously using the airflow rate measured by the ultrasonic flowmeter. The residence time requirement is complete when the time interval from the AWFCO or manual cessation of WDF equals the calculated residence time.

Table 9-1. Gas Residence Time Calculation Parameters

Kilns 1 and 2	
Physical Assumptions	
Kiln Diameter (ft)	12
Inside Kiln Diameter (ft)	10.5
Kiln Lining (inches)	9
Kiln Length (ft)	450
APCD Width (ft)	40
APCD Height (ft)	30
APCD Length (ft)	40
Hopper Height (ft)	6.0
Ductwork Length (ft)	67.5
Ductwork Height (ft)	8.0
Ductwork Width (ft)	8.0
Ductwork Volume (ft^3)	4,320
Stack Height (ft)	204.0
Stack Diameter (ft)	15.6
Kiln Volume Calculations	
Kiln Volume (cf)	38,966
APCD Volume (cf)	48,000
Hopper Volume (cf)	-
Stack Volume (cf)	38,992
Airflow Assumptions	
Lowest average stack gas flow rate from 2003 CPT, Condition I, Run 1 (acfm)	139,543
Gas Residence Time (sec)	60

10.0 OTHER COMPLIANCE DOCUMENTATION

10.1 Startup, Shutdown, and Malfunction Plan

Subpart EEE requires Essroc to develop and implement a Startup, Shutdown, and Malfunction Plan (SSMP) in accordance with 40 CFR Part 63, subpart A, section 63.6(e)(3). Section 63.6(e)(3) requires the SSMP to describe, in detail, procedures for operating and maintaining the source (i.e., kiln system) during periods of startup, shutdown, or malfunction and a program of corrective action for malfunctioning process and air pollution control equipment used to comply with relevant Subpart EEE standards. Essroc's current SSMP elements for affected process and air pollution control equipment are included in Attachment L. As changes to facility operations and regulatory requirements become effective, the SSMP will be revised as necessary.

10.2 Operator Training and Certification Plan

Subpart EEE, section 1206(c)(6) requires Essroc to establish training and, as appropriate, certification programs for personnel whose activities may reasonably be expected to directly affect emissions of HAPs from the affected source. The operator training and certification program must be recorded in the facility operating record. Essroc's current Operator Training and Certification Plan (OTCP) is included as Attachment L. As changes to facility operations and regulatory requirements become effective, the OTCP will be revised as necessary.

10.3 Operation and Maintenance Plan

Subpart EEE, section 1206(C)(7) requires Essroc to prepare and at all time operate according to an Operation and Maintenance Plan (OMP) that describes in detail procedures for operation, inspection, maintenance, and corrective action measures for all components of the kiln system, including associated pollution control equipment, that could affect emissions of regulated HAPs. The OMP must be recorded in the facility operating record. Essroc's current OMP is included as Attachment L. As changes to facility operations and regulatory requirements become effective, the OMP will be revised as necessary.

10.4 Feedstream Analysis Plan

Subpart EEE, section 63.1209(C)(2) requires Essroc to develop and implement a Feedstream Analysis Plan (FAP) and record it in the operating record. The FAP must specify:

- the parameters each feed stream is analyzed for to ensure compliance with applicable OPLs;
- whether the analysis will be obtained by performing sampling and analysis or by other methods;
- how the analysis will be used to document compliance with applicable feed rate limits;

- the test methods used to obtain the analyses;
- the sampling methods used to obtain a representative sample of each feed stream to be analyzed; and
- the frequency with which initial analyses of feed streams will be repeated to ensure that analyses are accurate and up to date.

Essroc's current FAP is included as Attachment K. As changes to facility operations and regulatory requirements become effective, the FAP will be revised as necessary.

ATTACHMENTS A THROUGH M

All attachments are included on the CD(s) at the end of this document.